



**THE
ARCHITECTURAL RECORD**

1934

4

FARM AND VILLAGE HOUSING

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Windham House Dormitory
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*Shreve, Lamb & Harmon,
Architects*

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VOL. 75 NO. 4
APRIL, 1934

THE ARCHITECTURAL RECORD

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For Stucco ✓

Preferably prepared, or factory-made; in a wide range of colors; for exterior finish of any texture; strong, sturdy, fire-safe.

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In standard or special finishes; in pleasant, interesting colors; in simple or ornamental design; permanent, beautiful.

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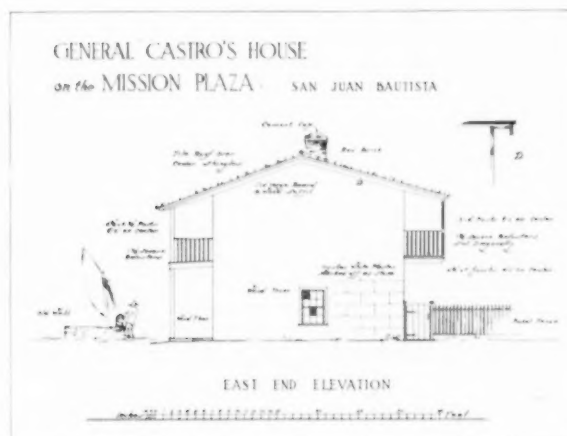
*Los Angeles County General Hospital
Architect: Allied Architects, Los Angeles*

Sound-absorbing, resilient, sanitary and colorful, linoleum has proved a most practical floor-covering for hospitals. 82,000 square yards of Sloane-Blabon Linoleum are used in the new Los Angeles County General Hospital. The bulk of this linoleum is used, of course, for floors. Some of it, however, is employed to cover the seats of the operating amphitheatre—the first time, we believe, that linoleum has been used for this purpose. Sloane-Blabon Corporation.

SLOANE-BLABON LINOLEUM

For the facts about Sloane-Blabon Linoleum see Volume "B", Sweets 1934 catalog. Or let us send you a portfolio, containing the same information. W. & J. Sloane Selling Agents, Inc., 577 5th Ave., New York.

THE ARCHITECT'S LIBRARY



SPANISH COLONIAL OR ADOBE ARCHITECTURE OF CALIFORNIA 1800-1850. By Donald R. Hannaford and Revel Edwards. *Architectural Book Publishing Company, Inc.*: 108 West 46th Street, New York City. 110 pages of plates. \$7.50

These plates consist of carefully prepared measured drawings, photographs and sketches. A brief introduction is written by Mr. Hannaford, describing the smaller adobes and the larger houses and cottages, their structure and locations. Paragraphs are written on the walls, roof coverings and textures, chimneys, balconies, shutters, doors and color schemes.

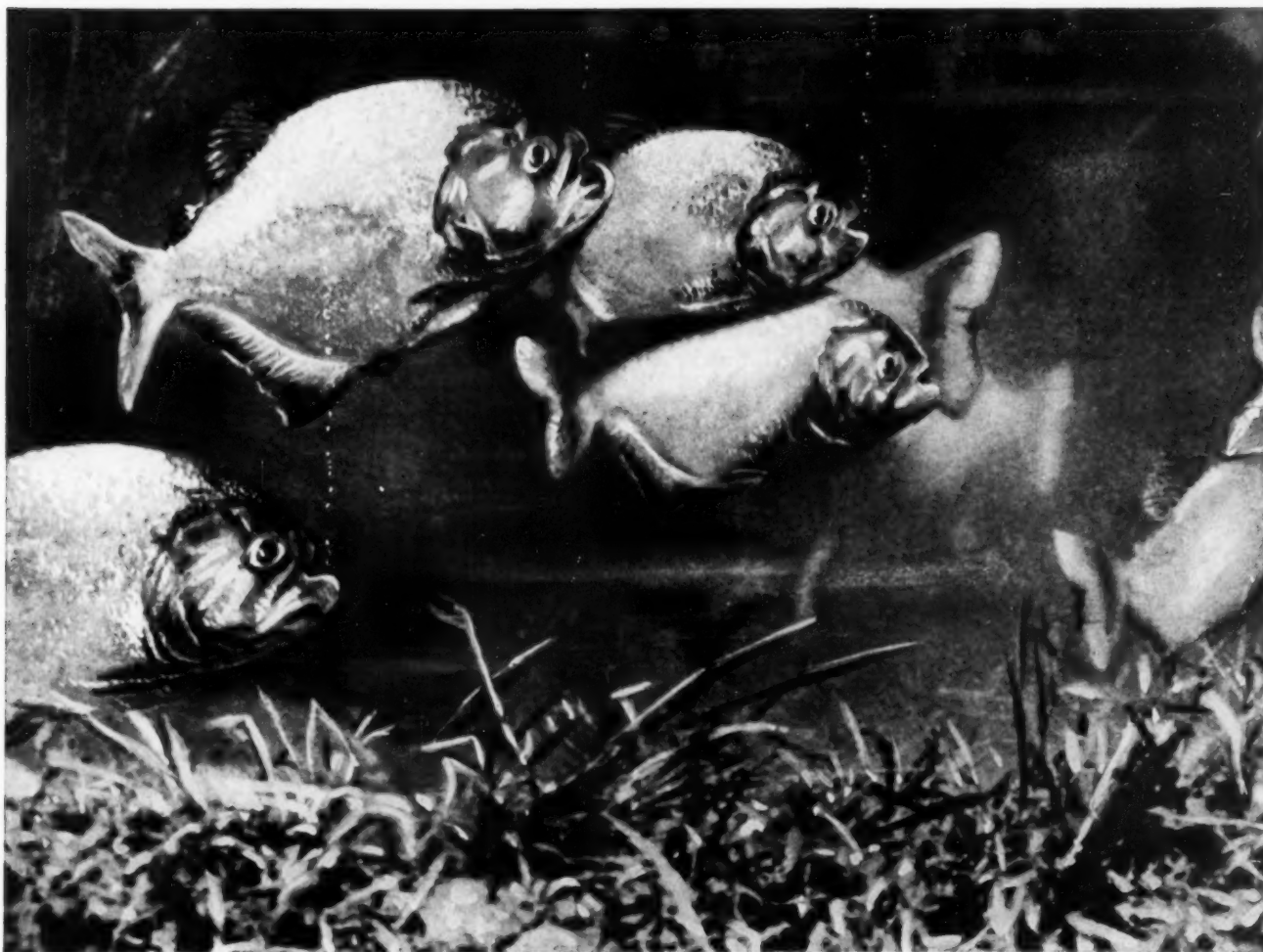
The plates are excellently reproduced, and characteristic. The photographs of old houses in Monterey, San Juan, Sonoma, Los Angeles and San Diego have been selected with a view toward giving typical details of gates, verandas, gables, balconies, windows, patios and walls, and the volume is completed with clear, measured drawings of these and other details.

A LIVING FROM THE LAND. By William B. Duryee, *Secretary of Agriculture, State of New Jersey.* Whittlesey House, McGraw-Hill Book Company: New York City. 189 pages, illustrated. \$1.50

Intended as a guide to city dwellers who have turned or are planning to turn to the land as a means of securing economic security, this book is largely an elementary discussion of do's and don'ts. A wide range of subjects is covered—financing the investment, building and servicing the home, making the soil produce crops, obtaining food from the garden, keeping bees and poultry, producing the family milk supply, and marketing farm products. At the end of the book is appended a suggested reading list.

Very little is said of the economic implications of subsistence farming on the industrialized urban areas from which the beginning farmers apparently are to be drawn, nor does the author give any attention to the problem facing our manufactures or our transportation and distribution systems if agriculture reverts to a basis of self-sufficiency.

OUR AQUARIUMS...



The home, the shop, the office, the store, the public building . . . these are man's aquariums. And the medium in which he moves, eats, sleeps . . . is AIR. Without air he perishes. ¶ In the vitally important work of making man's "aquariums" more habitable . . . the air he breathes more healthful and comfortable . . . B. F. Sturtevant Co. has spent a lifetime of effort. ¶ It is the benefit of this unequalled air engineering experience which you get in Sturtevant Equipment . . . whether fans for moving air, unit heaters for heating only, or apparatus for partial or complete air conditioning.

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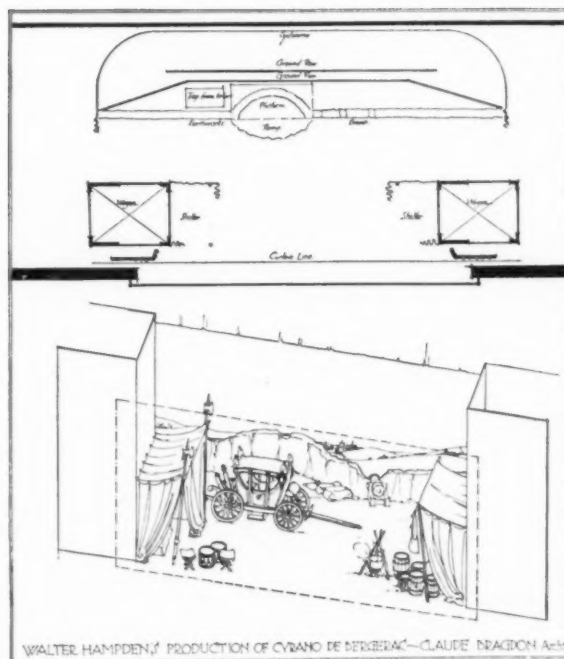
THE FROZEN FOUNTAIN. By Claude Bragdon, F.A.I.A., M.A. Alfred A. Knopf: 730 Fifth Avenue, New York. 125 pages. Illustrated. \$3.75

The Frozen Fountain is a collection of essays on architecture and the art of design in space. The author, who is as well known for his work in the theater, designed the scenery, costumes, properties and lighting of all of Walter Hampden's productions.

Here and there are such reflections as:

"For if life is indeed a fountain—a struggle upward—and nature a symbolization of that struggle, a work of architecture must be that too."

"Of all our architectural flora, the skyscraper alone is truly indigenous to the American soil . . . the skyscraper is a *natural growth*, and a symbol of the American spirit in its more obvious aspect . . . is important both as an architectural and as a social manifestation."



TEXNIKA XPONIKA (ANNALES TECHNIQUES). Official publication of the Technical Association of Greece, October-November, 1933. 15 Rue des Philhellènes, Athens. Price, 3 Swiss francs.

The addresses and events of the Fourth International Congress of Modern Architecture, which was held in Athens during August, 1933, have been recorded in a special edition of the Greek technical magazine. The text, amply illustrated, appears in French and German as well as Greek.

Sessions of the Congress were devoted to an analysis of The Functional City. Plans and statistical data of 34 cities (including Detroit, Los Angeles and Baltimore) had been prepared in advance by various groups of architects and town planners as a basis for discussion. This material has now been turned over to Dr. Neurath of the Social and Economic Museum of Vienna to be correlated for presentation in book form at a later date. Dr. Neurath, who has become well known in this country for his development of pictographs for charts and museum displays, has been commissioned by the Congress to prepare a special set of graphic symbols which will simplify and standardize town plan drawings.

Additional information concerning membership and activities of the Congress can be obtained from the American representatives, K. Lönberg-Holm, 119 West 40th Street, New York City, or Richard Neutra, 1348 North Douglas Street, Los Angeles.

ALBERT DESIGN CHARTS. Published by Opla Company, P. O. Box 66, East Orange, New Jersey. 12 sheets, 8½" x 11", punched for loose-leaf binding. 20 cents each; \$1.20 for the set.

By arranging several charts on the same sheet, the author simplifies the process of designing concrete beams, columns and slabs. Factors found on one chart according to the given conditions of a problem are traced through to adjacent charts for additional desired information. Thus eliminating the necessity of consulting tables or charts in different sections of a handbook. Many of the charts prepared by Prof. Albert, who teaches advanced engineering at New York University, have appeared in Engineering News-Record in recent years. On each sheet is included an example to illustrate the use of the chart combination. One sheet is devoted to an explanation of the fixed point theory for continuous beams.



BRIXMENT, THE LEADING MASONS' CEMENT

FOR almost twenty years, Brixment has been widely used on many of the nation's outstanding buildings. This is due to the fact that Brixment has a *combination* of advantages, which no other mortar materials can offer:

Requires no soaking or slaking. No need to send either men or materials to the job in advance.

Has ideal plasticity—saves bricklayer's time and insures neater, cleaner brick-work.

Is waterproofed, with calcium stearate, during manufacture. Will not air-set or cake in storage.

Prevents efflorescence; keeps mortar colors from fading.

Makes a good tight bond, and has greater strength than the brick itself.

Its simple mix makes close supervision unnecessary. Always uniform in strength, color and workability.

Costs less than the cement and lime required to make an equal amount of good mortar.

One part Brixment, three parts sand, make the best mortar for any kind of masonry . . . Five bags lay approximately one thousand brick.

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BRIXMENT

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ARCHITECTS' ANNOUNCEMENTS

The firm of Calrow, Brown & Fitz-Gibbon is now known as Brown & Fitz-Gibbon, with offices in Royster Building, Norfolk, Virginia. Major Charles J. Calrow has left the firm to enter Government service.

Henry G. Morse and Edgar Albright announce the formation of the firm of Morse & Albright, architects, with offices at Essex Fells, New Jersey.

The consolidation of the architectural practice of Addison Mizner, Inc., and William Manly King, architects, is announced. Offices are at Via Mizner, Palm Beach, Florida.

The Housing Study Guild announces the removal of its offices from 400 Madison Avenue to 101 Park Avenue, Room 1113.

Appointment of M. Georges Dengler, French architect, to be professor of design in the department of architecture of the School of Fine Arts, University of Pennsylvania, is announced.

The State Association of California Architects, Northern Section, has started a series of one-man architectural exhibits to last two weeks each. The exhibits are being shown on the ground floor of the Building Material Exhibit building, near the main entrance from Market Street.

COMPETITION FOR DESIGN OF BARS

The Brunswick-Balke-Collender Co. announces a competition for designs for a deluxe bar, a commercial bar, and a service bar, conducted under the rules and regulations of the American Institute of Architects, and open to:

- (a) Architects, draftsmen, artists and interior decorators who hold university, college or institute degrees.
- (b) Architects, draftsmen, artists and interior decorators who do not hold degrees, but who have had at least two years practical experience.
- (c) Students of architecture, art or interior decorating who have had two or more years of work prescribed by a university, college or institute.

Competitors may collaborate and any resident of the United States, Canada, Mexico or the Hawaiian Islands is eligible to compete provided he or she has the above qualifications.

The competition will be in three divisions with separate first, second, third and mention awards for each division. The highest prizes will be for \$500, the lowest for \$25, a total of 117 prizes amounting to \$5,000.

The Jury will consist of one member of the Brunswick-Balke-Collender organization, one or two staff members of prominent hotels and the rest

CALENDAR OF EXHIBITIONS AND EVENTS

April 2-29	Free exhibition of The Fashion Group, Inc., 30 Rockefeller Center, New York City.
April 3-30	Industrial Arts Exposition, R.C.A. Building, Rockefeller Center, New York City, 63rd floor.
April 29	Symposium on Economic Insecurity and The Place of the Professional Worker in the Struggle for Social Insurance at open meeting of Inter-Professional Association for Social Insurance to be held at 8:15 o'clock Sunday evening at Engineering Auditorium, 29 West 39th Street, New York City. Jules Korchien will speak for the architectural profession.
May 1	Closing date for applications, Princeton Prizes in Architecture, Princeton University, Princeton, New Jersey.
May 1	Closing date for applications for Kinley Memorial Fellowship, College of Fine and Applied Arts, University of Illinois. Apply to Rexford Newcomb, Dean, Urbana, Illinois.
Until May 1	Exhibition of "New York Night Scenes," by Samuel H. Gottscho, photographer, at the Museum of the City of New York.
May 15	Closing date for applications for Brunswick-Balke-Collender bar design competition. Apply to Angelo R. Clas, professional adviser, 333 North Michigan Avenue, Chicago.
May 16-18	Sixty-sixth Convention of The American Institute of Architects, to be held in Washington, D. C.
May 19-31	Competition for the Princeton Prizes in Architecture.
Until June, 1934	Remodeling Competition, conducted by the Good Housekeeping Studio, 57th Street and Eighth Avenue New York City.

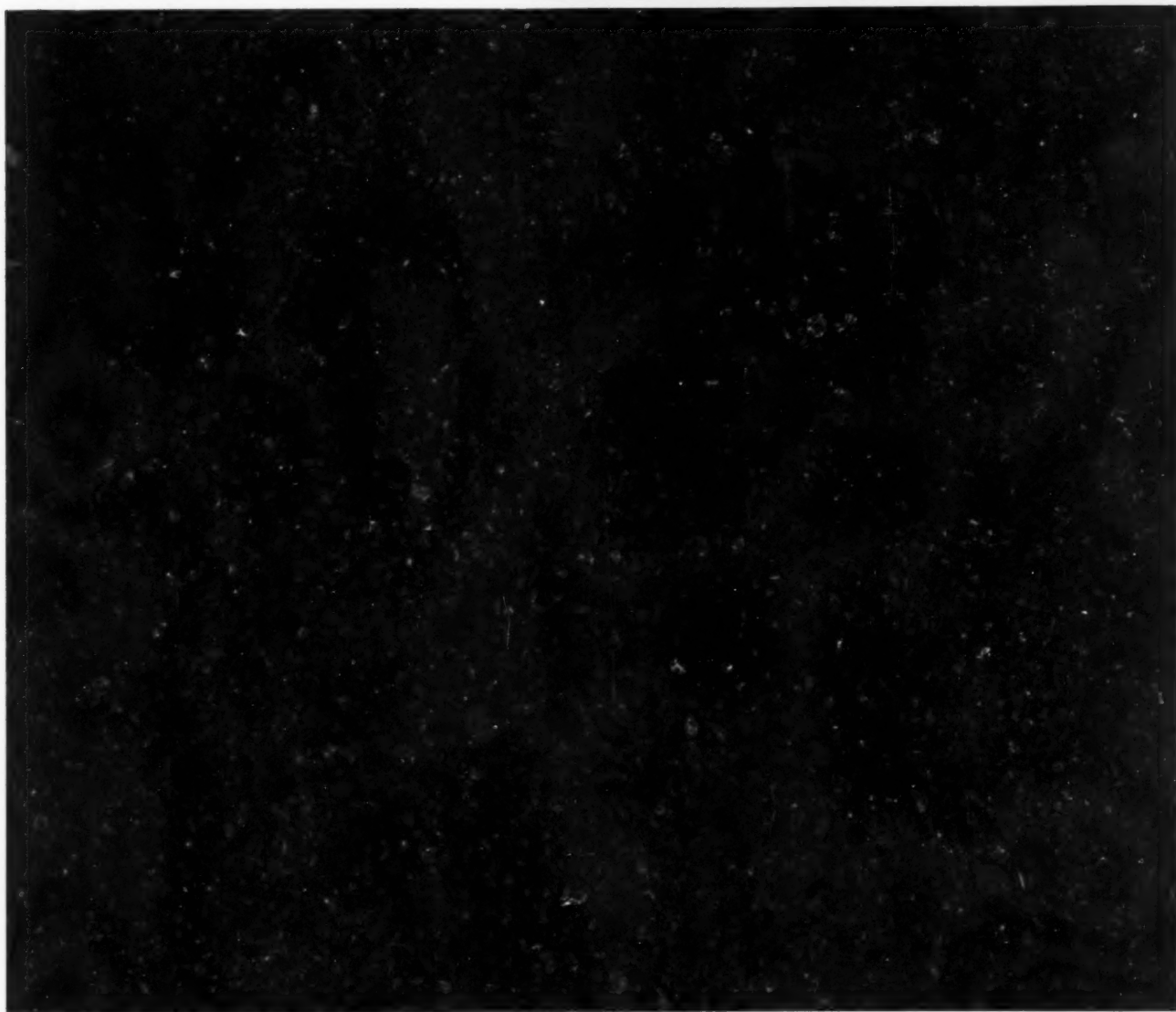
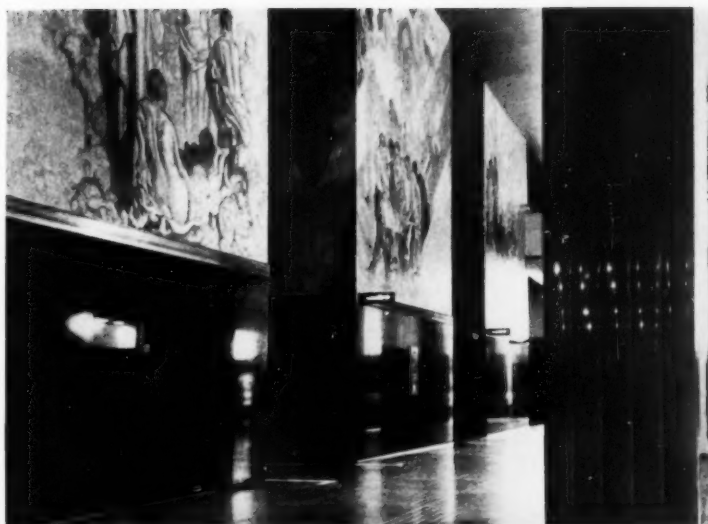
will be leading architects and artists. The competition will be one of design, color and arrangement, entirely free from mechanical or technical details. Programs will be ready for distribution April 16 and applications must be made in writing to the Professional Adviser, Angelo R. Clas, 333 North Michigan Avenue, Chicago, Ill., not later than May 15.

HISTORIC AMERICAN BUILDINGS SURVEY

A black-and-white review of American Architecture which will divide the country into thirty-nine units, each competing for the cherished honor of being acclaimed the home of the Nation's most perfect development of the builder's art—this is the novel form which is being taken by the National exhibition of the Historic American Buildings Survey, already announced by Secretary Ickes for the National Museum, April 5-26. Drawings, photographs and charts for the show will be selected from among the thousands of painstaking records being made for the Government by architects and draftsmen organized for the work by the National Park Service and the American Institute of Architects.

FRENCH GRAY

FRENCH GRAY is quarried from the Vermont Marble quarries at Isle La Motte, in Grand Isle County, at the northwest tip of the state. It is a marble of minutely mottled design, almost black in mass, with a faint granular suspicion of red and blue. Especially adapted for interior use, French Gray finds decorative employment frequently as a corridor base. The small photograph shows its use in the elevator bays on the main floor of the new R. C. A. Building in Rockefeller Centre. The architects: Reinhard & Holmeister; Corbett, Harrison and MacMurray; and Hood & Fouilhoux. Architects are invited to write for "Color Plates of Vermont Marble," illustrating, in full color, French Gray and twenty-two other varieties. Address: Vermont Marble Company, Proctor, Vermont.



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IN THIS ISSUE

MODERNIZATION AND NEW CONSTRUCTION OF FARMHOUSES

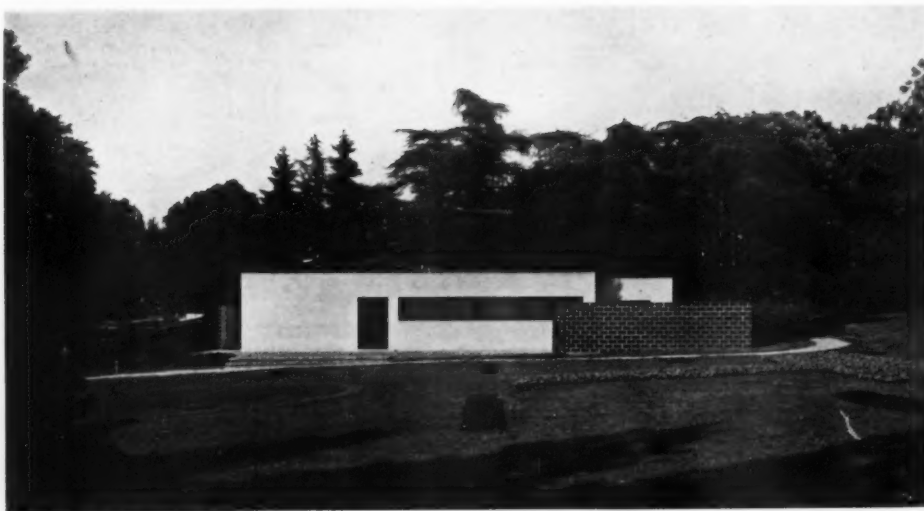
To provide information for a program of improvement of farm and village housing, a field survey of all farmhouses in about 300 rural counties in 46 States has been made by the U. S. Department of Agriculture. The survey is a sampling device to determine (1) the extent of the need for modernizing or replacing the 6,000,000 farm dwellings in the United States and (2) the amount of inexpensive Government credit required by farm and village home owners to insure success for the program. The program interlocks with the Administration's purpose to make low-cost electric current available through hydro-electric projects. The farm and village housing improvement program is designed as a major agency of recovery for the building industry and its influence will extend over a long period in response to hydro-electric development. The results of the survey are so presented in this issue as to show detailed findings both with respect to structural repairs, extensions and replacements and with respect to sanitary and labor-saving devices.

FARM AND VILLAGE HOUSE ARCHITECTURE

The U. S. Department of Agriculture has also carried out an investigation to prepare a series of designs for new farm and village houses, of suggestions for remodeling and of specifications for equipment. The information gathered represents the cooperative effort for each State of home economists, agricultural engineers, rural architects and extension workers of colleges and other public institutions. The problems of plan, design, construction and equipment of farm and village houses differ only in detail and not in principle, from those of suburban dwellings. The illustrations, text and check lists published by permission in this magazine constitute an invaluable source book of information for architects interested in private house work whether from the point of view of modernization or new construction.

TECHNICAL NEWS AND RESEARCH

Installation of equipment specified in the foregoing architectural studies depends upon low-cost power, which in some regions is not yet supplied commercially. A special article has therefore been obtained from P. Burke Jacobs, Chief of Laboratory, Agricultural By-Products Laboratory, Ames, Iowa, dealing with the various devices available for generating heat, light and power from waste products on the farm.



NEXT MONTH

The May issue will be a special number devoted to MODERN EUROPEAN ARCHITECTURE. Examples of current work in England, France, Germany, Sweden, Switzerland and other countries will be featured.

ELECTRICITY IN THE HOME is a study prepared by Henry L. Logan, engineering consultant. The article includes a functional checklist of equipment on the market.



Ewing Galloway

VOL. 75 NUMBER 4

1 9 4 3 4
A P R I L

T H E ARCHITECTURAL RECORD

BETTER HOMES AS AN AID TO RECOVERY

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THE RECOVERY PROGRAM HAS AMONG ITS GENERAL AIMS THE FOLLOWING OBJECTIVES: (1) TO PLACE AGRICULTURE AND INDUSTRY ON A FOOTING OF EQUALITY AS REGARDS THE EXCHANGE VALUE OF THE COMMODITIES WHICH THEY PRODUCE AND (2) TO RAISE THE STANDARDS OF LIVING BOTH IN THE AGRICULTURAL AND IN THE INDUSTRIAL POPULATION. IN FURTHERANCE OF THE SECOND OF THESE OBJECTIVES, A PROGRAM OF URBAN HOUSING IMPROVEMENT IS TO BE PARALLELED BY A PROGRAM FOR IMPROVEMENT OF FARM AND VILLAGE HOUSING.

TO PROVIDE BASIC INFORMATION FOR THE LATTER PROGRAM, A FIELD SURVEY HAS BEEN MADE OF ALL FARM-HOUSES IN ABOUT 300 RURAL COUNTIES IN 46 STATES. THE SURVEY IS A CIVIL WORKS PROJECT, CARRIED OUT BY THE U. S. DEPARTMENT OF AGRICULTURE AND THE STATE AGRICULTURAL EXTENSION SERVICES.

THE SURVEY DEALT NOT ONLY WITH STRUCTURAL CONDITIONS BUT ALSO WITH CONDITIONS RELATED TO SANITARY AND LABOR-SAVING DEVICES, PROGRESS IN THE PROVISION OF WHICH HAS BEEN RETARDED IN RESPECT OF FARM HOMES COMPARED WITH URBAN DWELLINGS—WATER SUPPLY AND SEWAGE DISPOSAL; LIGHT AND HEAT; REFRIGERATION, LAUNDRY AND COOKING FACILITIES; LANDSCAPING OF HOMESTEADS.

TO GAUGE THE IMPLICATIONS OF THE QUESTIONS ASKED WITH REGARD TO SANITARY AND LABOR-SAVING DEVICES, ONE MUST BEAR IN MIND THE DECLARED PURPOSE OF THE ADMINISTRATION TO MAKE ELECTRIC CURRENT AVAILABLE FOR THE AVERAGE HOME. THAT AN ERA OF GENERALLY DISTRIBUTED INEXPENSIVE CURRENT IS AT HAND IS EVIDENT FROM THE HYDRO-ELECTRIC PROJECTS UNDER CONSTRUCTION OR AUTHORIZED. AMONG THESE MAY BE MENTIONED THE TENNESSEE RIVER PROJECT FOR THE SOUTHEAST, BOULDER DAM FOR THE SOUTHWEST, THE BONNEVILLE AND GRAND COULEE PROJECTS FOR THE NORTHWEST, AND OTHER PROJECTS FOR THE GREAT INTERIOR TRIBUTARY TO THE MISSISSIPPI RIVER.

Each state group was asked to submit plans for new farmhouses in the following price ranges, based on NRA prices and wage rates.

REGION	FIRST PRICE RANGE	SECOND PRICE RANGE	THIRD PRICE RANGE
EASTERN STATES	UNDER \$1,500	\$1,500 - \$3,500	\$3,500 - \$7,000
CENTRAL STATES	UNDER 1,500	1,500 - 3,500	3,500 - 7,000
SOUTHERN STATES	UNDER 750	750 - 2,500	2,500 - 5,000
WESTERN STATES	UNDER 1,200	1,200 - 3,000	3,000 - 6,000

IN ANTICIPATION OF A FEDERAL PROGRAM FOR MODERNIZING OLD FARMHOUSES AND CONSTRUCTING NEW ONES, THE CIVIL WORKS ADMINISTRATION HAS ALSO SPONSORED AN INVESTIGATION BY THE BUREAU OF HOME ECONOMICS IN COOPERATION WITH THE BUREAU OF AGRICULTURAL ENGINEERING AND OTHER AGENCIES OF THE U. S. DEPARTMENT OF AGRICULTURE TO PREPARE A SERIES OF DESIGNS FOR NEW FARMHOUSES, OF SUGGESTIONS FOR REMODELING AND OF SPECIFICATIONS FOR EQUIPMENT. THE INFORMATION GATHERED BY THE INVESTIGATION REPRESENTS THE COOPERATIVE EFFORT FOR EACH STATE OF HOME ECONOMISTS, AGRICULTURAL ENGINEERS, RURAL ARCHITECTS, AND EXTENSION WORKERS OF COLLEGES AND OTHER PUBLIC INSTITUTIONS.

EACH STATE GROUP WAS ASKED TO SUBMIT AMONG OTHER ITEMS PLANS FOR NEW FARMHOUSES IN THREE PRICE RANGES, BASED ON NRA PRICES AND WAGE RATES. THESE PRICE RANGES, IN CONNECTION WITH COOPERATIVE EXPERT PLANNING, ARE CALCULATED TO BRING OUT INFORMATION NOT OBTAINABLE ELSEWHERE ON SOUND LOW-COST EQUIPMENT AND CONSTRUCTION BY USE OF PRODUCTS ACTUALLY ON THE MARKET.

THE PROBLEMS OF PLAN, DESIGN, CONSTRUCTION AND EQUIPMENT OF FARMHOUSES DIFFER ONLY IN DETAIL, AND NOT IN PRINCIPLE, FROM THOSE OF SUBURBAN DWELLINGS. NEVER WITHIN OUR KNOWLEDGE HAVE SO MANY KINDS OF SPECIALISTS OVER SO WIDE A GEOGRAPHICAL AREA CONTRIBUTED PERSONAL EXPERIENCE TOWARDS THE SOLUTION OF AN ARCHITECTURAL PROJECT. THE COMPILATION OF THE RESULTS IS IN THE HANDS OF DR. S. H. McCrory AND MR. WALLACE ASHBY OF THE BUREAU OF AGRICULTURAL ENGINEERING, U. S. DEPARTMENT OF AGRICULTURE, THROUGH WHOSE COURTESY THIS MAGAZINE IS PRIVILEGED TO PUBLISH WHAT IS IN EFFECT AN ILLUSTRATED REPORT ON THOSE FEATURES WHICH HAVE PARTICULAR VALUE FOR ARCHITECTS.



Nesmith

ASSUMING THAT THE FACTS UNCOVERED BY THE FARMHOUSE SURVEY ARE APPLICABLE TO THE SIX MILLION FARM DWELLINGS IN THE UNITED STATES, AND ASSUMING FURTHER THAT THE ADMINISTRATION SUCCEEDS IN RAISING THE EXCHANGE VALUE OF AGRICULTURAL COMMODITIES, ONE IS LED TO CONCLUDE THAT THE FARM AND VILLAGE HOUSING IMPROVEMENT PROGRAM MAY BECOME AN IMPORTANT FACTOR IN THE BUILDING INDUSTRY AND THAT ITS INFLUENCE MAY EXTEND OVER A LONG PERIOD IN RESPONSE TO THE TREND TOWARDS HYDRO-ELECTRIC DEVELOPMENT.

THE FARM AND VILLAGE HOUSING PROGRAM IS INTERLOCKED WITH A PROGRAM FOR IMPROVEMENT OF MODERATE-COST URBAN HOUSING. BOTH PROGRAMS ARE BASED ON FIELD SURVEYS TO COMPUTE (1) THE EXTENT OF THE NEED FOR REPAIRS, MODERNIZATION AND NEW CONSTRUCTION AND (2) THE AMOUNT OF LOW-COST FINANCING REQUIRED. AT THIS WRITING THE RESULTS OF THE URBAN OCCUPANCY-VACANCY SURVEY HAVE NOT YET BEEN RELEASED, BUT THEIR TREND IS A MATTER OF GENERAL KNOWLEDGE.

EACH OF THESE PROGRAMS DEPENDS FOR SUCCESS UPON LOW-COST FINANCING. A PLAN FOR REORGANIZATION OF MORTGAGE FACILITIES AND FOR OTHERWISE LOWERING THE COST TO HOME OWNERS PARTICIPATING IN THE BETTER HOUSING CAMPAIGN WILL PROBABLY BE ADOPTED.

THIS FORM OF BETTER HOUSING CAMPAIGN WILL ENCOUNTER NO SUCH HINDRANCES OF DIVIDED OWNERSHIP AND ARTIFICIAL LAND VALUES AS HAVE SLOWED UP THE PLAN FOR SLUM CLEARANCE AND LOW-RENT HOUSING. IT IS SIMPLE OF EXECUTION, IF INEXPENSIVE FINANCING IS SUPPLIED; AND ITS POSSIBILITIES AS AN AGENCY OF RECOVERY IN THE CAPITAL GOODS INDUSTRIES ARE OBVIOUS.



Photos, U. S. Dept. of Agriculture

1 Negro quarters, South Carolina—meeting house at end of group.

2 Negro house, Gaffney, South Carolina.

3 Negro cabin on plantation in South Carolina.

4 Typical mid-western farmhouse. The original 2-room house was expanded with increase of family by the addition of a wing and porch.

5 A typical farmhouse in Mississippi.

6 Farm home, Jasper, Tennessee. Cistern at right. Kitchen at rear.

SURVEY OF FARM CONDITIONS

The Farm Housing Survey is a Civil Works Administration project under the direction of the U. S. Department of Agriculture and the State Agricultural Extension Services. The objective is the provision of basic information necessary for a program of improvement for farm homes.

About 300 counties throughout the United States have been covered by the investigation. Approximately one-tenth of the counties, representing ten different states and comprising a total of roughly 57,600 farmhouses, have already been reported and the findings issued in preliminary form, subject to later revision, by the Department of Agriculture. The accompanying tables have been prepared by The Record from data contained in the county reports; they conform to the major divisions of the questionnaire used by the CWA enumerators. Although the reports issued to date (March 28) represent too small a sample to justify very definite conclusions, except for the particular localities, it is likely that subsequent reports will not materially change the relative statistical importance of those factors which appear predominant in the tabulations.

In view of the plans of the Administration in Washington to extend credit to finance needed renovation and modernization of dwellings, the tables should be useful in indicating the general scope of such a construction program for the rural districts as well as showing the relative significance of individual items of repair or addition most desired by the farm populations. The Housing Survey reveals clearly and emphatically a number of insufficiencies in the construction and equipment of American farmhouses.

1

TYPES OF FARM HOUSES

STATE	COUNTY	TABULATED FARMHOUSES	LOG HOUSES	EARTH HOUSES	FRAME HOUSES— UNPAINTED	FRAME HOUSES— PAINTED	STUCCO HOUSES	BRICK HOUSES	STONE HOUSES	CONCRETE HOUSES	AVERAGE NUMBER OF ROOMS PER HOUSE	NUMBER OF FARMS IN 1929	FARM POPULATION
ARKANSAS	Arkansas	2631	118		1583	927	2	1			4	2301	12973
	Faulkner	3370	153		2211	979	5	7	14	1		4204	21467
FLORIDA	Orange	1492	10		306	1094	55	13	1	13	5	1608	5127
INDIANA	Benton	1392			100	1241	18	24	2	5	10	1195	6225
KENTUCKY	Bourbon	1461	30			1165		173	23			1896	8394
	Boyle	973										1251	5760
	Calloway	2792	78		715	1983						2990	12883
	Fleming	1907	261		380	1217		49				2642	9329
	Hardin	2642	307	3	560	1705	2	61	2	2	5	2752	3058
	Hickman	1426	37		671	706	1	1		1	3	1434	6424
	Knott	2114	568		957	597		2	9	9	3	1951	15510
	Ohio	2610	220	1	958	1425						3191	14277
	Shelby	2015	66	1	156	1625	10	146	4	7	7	2337	11220
	Simpson	1749	108		575	1028					5	1797	8144
LOUISIANA	Acadia Parish	3575		10	2755	808	1	1			4	3228	19813
	Beauregard	1371	117		839	411	2	2			4	1374	7056
MAINE	Knox	1000			55	933	12		1		8	1845	5794
MINNESOTA	Stevens	1250										1292	6355
NEBRASKA	Cuming	1770		1	11	1719	24	21	1	1	7	1943	9562
	Otoe	2093									7	2280	9617
NEVADA	Washoe	1056	4	23	388	535	29	37	9	31	4	1088	4997
	Churchill												
N. CAROLINA	Cleveland	2871	78		1899	843	3	40	2	6	5	5181	30030
	Duplin	2311	22		1600	685		3		1	5	4970	26210
OKLAHOMA	Beaver	1825										2047	8636
RHODE ISLAND	Providence	1139			41	1082	3	5	8		10	1390	6281
TENNESSEE	Knox	3357										4039	12689
VIRGINIA	Rockingham	3346										3434	17849
WASHINGTON	Snohomish	2041	18		475	1542	4	4	2	1	5	4262	18482

In general, restricted space goes along with inferior construction. Counties, particularly those in the South, which have a large proportion of log houses and unpainted frame houses also show a small average number of rooms per house. In the northern states, like Indiana, Maine, Nebraska and Rhode Island, the houses are larger and better constructed. Considerable variation, however, is shown between the various counties within a single state, such as Kentucky. Knott County, with a large proportion of log houses and unpainted frame houses, has a population that averages 8 individuals to a farm, all of whom are sheltered, by statistical averages, in houses of only 3 rooms. Shelby County, on the other hand, has a large proportion of brick houses and painted frame houses, and an average occupancy of less than 5 persons for farmhouses that average 7 rooms.



Photos, U. S. Bureau of Agricultural Engineering

- 1 Barn wrecked by tornado near Columbus, Mississippi, indicating need for tornado-proof construction.
- 2 House with field stone walls, Jasper, Tennessee.
- 3 Sweet potato storage house, Franklinton, North Carolina.

- 4 An improved water wheel for pump. Wheel made from parts of old Ford car—Billingsley, Alabama.
- 5 Canning shed, Shorter, Alabama.
- 6 Water supply with oil barrel for tank—Athens, Mississippi.

CONDITION OF HOUSES

COMPLETE REPLACEMENT NEEDED (Approximate Percentages)

The highest percentages appear generally in the exterior paint column, although in a few counties screens are indicated as the most imperative need. The percentages range surprisingly high for both replacement items, particularly in the southern states.

Interior walls and ceilings, roofs, doors and windows, foundations, and floors are other items which are generally needed throughout the country. In the South new exterior walls are required.

In Orange County, Florida, 86 per cent of the houses need insulation, a condition which has been emphasized perhaps by the unusually cold weather just preceding the farm census. Similarly, insulation appears as the major need in Knox County, Maine, which lists 32 per cent of the farmhouses in this category. The preliminary government reports do not give complete information as to the number of houses needing replacement entirely. From the percentages for the three states listed in this column—Kentucky, Nebraska and Nevada—it is clear, however, that not all slum dwellings are confined to urban areas.

STATE	COUNTY	TABULATED FARMHOUSES	FOUNDATIONS	EXTERIOR WALLS	ROOFS	CHIMNEYS	DOORS AND WINDOWS	SCREENS	EXTERIOR PAINT	INTERIOR WALLS AND CEILING	FLOORS	INSULATION	ENTIRE HOUSE
ARKANSAS	Arkansas	2631	25	15	24	22	19		54	30	14		
	Faulkner	3370	20	11	21	15	16	41	62	43	13		
FLORIDA	Orange	1492	15		19	24	13	28	44	33	11	86	
INDIANA	Benton	1392	11		10		8	24	40	10	7	8	
KENTUCKY	Bourbon	1461	8	4	7		6	15	19	6	5	16	6
	Boyle	973	11	9	12		11	36	50	12			
	Calloway	2792	24	18	39	14	23	53	75	36	23		11
	Fleming	1907			11	5	6	20	26	6	6	14	
	Hardin	2642	6		14		6	28	43	7			3
	Hickman	1426	22	18	31	8	18	35	61	17	15	28	
	Knott	2114	21	17	30	14	31	75	57	25	21	44	22
	Ohio	2610	17	17	33	11	25	54	67	21	19		6
	Shelby	2015	6	2	12		5	22	49	6	4	12	
	Simpson	1749			19		11	30	52		7	52	8
LOUISIANA	Acadia Parish	3575	22	20	27	24	25	30	12	17	12		
	Beauregard	1371	33	24	38	30	46			27	30		
MAINE	Knox	1000	1		1	2	2	12	7			32	
MINNESOTA	Stevens	1250	16				14	33	30		15		
NEBRASKA	Cuming	1770	8		8			12	39	6			3
	Otoe	2093	5		6			8	17	6	5		6
NEVADA	Washoe	1056	28	15				25	44	18	19	22	23
	Churchill												
N. CAROLINA	Cleveland	2871	8		14		12	57	76	19	12		
	Duplin	2311	4	2	4	3		72	71	15	4		
OKLAHOMA	Beaver	1825		12	26	45	19	33	53	18	19		
RHODE ISLAND	Providence	1139			3		2	3	3	2	2		
TENNESSEE	Knox	3357	13		22			33	44	17	10		
VIRGINIA	Rockingham	3346		10	8	6	8	22	35	15	9		
WASHINGTON	Snohomish	2041		11	19			18	34	13	11	10	

NEED FOR ADDITIONAL SPACE

ROOMS NEEDED (Approximate Percentages)

Every county reports that relatively large percentages of the farmhouses require additional bedrooms. In some instances, particularly in Kentucky, the percentages are exceeded in magnitude by the entries in the columns for bathrooms and for storage space for fruits and vegetables, although these items apparently are not so widely needed throughout the nation.

Basements stand out as a need in Kentucky. Porches likewise are indicated for this state and for North Carolina, Arkansas and Nevada. In North Carolina, Louisiana and Arkansas living rooms are noticeably lacking. In only a few counties are washrooms for farm help listed as a space requirement.

STATE	COUNTY	TABULATED FARMHOUSES	BEDROOM	LIVING ROOM	DINING ROOM	WORKROOM	WASHROOM For Farm Help	BATHROOM	BASEMENT	FRONT OR SIDE PORCH	BACK PORCH	STORAGE SPACE For Fresh Fruits and Vegetables
ARKANSAS	Arkansas	2631	11	6			4			5	7	7
	Faulkner	3370	30	12	16	12					18	43
FLORIDA	Orange	1492	36		18			21		11	15	31
INDIANA	Benton	1392	5				5	8				6
KENTUCKY	Bourbon	1461	11		3			9	3		7	11
	Boyle	973	8	6						7	10	25
	Calloway	2792	37		20	17		30	37		19	
	Fleming	1907	7		4	9				11	12	24
	Hardin	2642	16	1	1					12	15	21
	Hickman	1426	39		18	20		39	32		17	
	Knott	2114	62	31		16		27	33			63
	Ohio	2610	23	41	39	29	27	67	50	27	36	57
	Shelby	2015	13		12	28	21	41	27		19	36
	Simpson	1749	15		10			27	10	11	17	59
LOUISIANA	Acadia Parish	3575	51	8	6					18	13	
	Beauregard	1371	46	25	28	26		49				49
MAINE	Knox	1000	13					16				1
MINNESOTA	Stevens	1250	8		2				5			
NEBRASKA	Cuming	1770	6		2			20	4			
	Otoe	2093	8		3		3	5				3
NEVADA	Washoe	1056	47	13	17	15	32			19	19	18
	Churchill											
N. CAROLINA	Cleveland	2871	41	38	34	25					25	33
	Duplin	2311	19	23	16	11				11	19	
OKLAHOMA	Beaver	1825	26			6		30		4		
RHODE ISLAND	Providence	1139	4		1			6				
TENNESSEE	Knox	3357	29	5	5			8		1		
VIRGINIA	Rockingham	3346	7		5	2		17		2	9	
WASHINGTON	Snohomish	2041	29		4			20	7	5	4	6



WASH-HOUSE IN YARD OF
HOUSE NEAR GAFFNEY, S. C.



BARREL FOR WATER SUPPLY,
HOUSE NEAR GAFFNEY, S. C.

4

WATER SUPPLY AND SEWAGE DISPOSAL

EXISTING FACILITIES
(Approximate Percentages)

STATE	COUNTY	TABULATED FARMHOUSES	WATER CARRIED BY HAND	HAND PUMP IN DWELLING	RUNNING WATER COLD	RUNNING WATER HOT	OUTDOOR TOILETS UNIMPROVED	OUTDOOR TOILETS IMPROVED	INDOOR TOILETS IMPROVED	TUB OR SHOWER BATHS	KITCHEN SINKS WITH DRAIN
ARKANSAS	Arkansas	2631	95	1	7	2	74	4	2	5	7
	Faulkner	3370	97	3	1		70	4	2	1	4
FLORIDA	Orange	1492	43	17	43	19	50	12	36	46	48
INDIANA	Benton	1392	70	27	30	15	52	32	16	27	64
	Bourbon	1461	83	3	17	15	71	22		16	19
KENTUCKY	Boyle	973	80	8	9	8		13		10	13
	Calloway	2792	99	1	1		71	1	1	1	
	Fleming	1907	94	5	3		87	1	2	2	7
	Hardin	2642	92	5	3	1	84	5	2	3	7
	Hickman	1426	74	1	4	1	69	7	1	3	7
	Knott	2114	98		1		86	3			1
	Ohio	2610	96	4	1		87	1		1	9
	Shelby	2015	91	5	8	7	84	15		8	12
	Simpson	1749	92	6	5	2	75		3	4	9
LOUISIANA	Acadia Parish	3575	85	6	8	1	76	5	2	6	5
	Beauregard	1371	94	2	6	2	61	13	3		
MAINE	Knox	1000	34	37	33	14	66	17	18	15	98
MINNESOTA	Stevens	1250	91	54	7	3	76	20	6	7	30
NEBRASKA	Cuming	1770	48	20	31	16	84	1	20	28	61
	Otoe	2093	66	19	12	15	86	1	16	22	45
NEVADA	Washoe	1056	1	1	47	35	69	6	29	41	63
	Churchill										
N. CAROLINA	Cleveland	2871	82	6	5	2	56	12	2	3	8
	Duplin	2311	72	29	1		64	6	2	1	8
OKLAHOMA	Beaver	1825	73	2	21	4	86			11	25
RHODE ISLAND	Providence	1139	26	14	64	33	34	24	46	54	97
TENNESSEE	Knox	3357	83	6	11	7	62	25	6	9	19
VIRGINIA	Rockingham	3346	70	13	19	9	81	13		12	27
WASHINGTON	Snohomish	2041	38	4	57	42	63	6	32	42	62

The insufficient living standards of the rural districts, especially in the South, are revealed by the contrasting percentages for improved and unimproved sanitary facilities. Even in Providence County, Rhode Island, which shows the highest percentage of farmhouses with improved indoor toilets, 34 per cent of the houses still have outdoor privies. Furthermore, if the percentages for both improved and unimproved facilities are added together, it may be observed that surprisingly many farmhouses in Arkansas, Kentucky, Louisiana, North Carolina, Oklahoma, Tennessee and Virginia seem to be lacking in even minimum sanitary requirements.

The counties in Rhode Island, Washington, Nevada, Florida, Maine and Indiana have the largest number of houses with both hot and cold running water, but the percentages show that even in these localities the majority of farmhouses do not have such conveniences. In the South, as the high percentages indicate, water is carried by hand in most farmhouses. Only in Rhode Island is there a county wherein more than half of the houses have tubs or shower baths.

Ice boxes are much more common than mechanical refrigeration, but the low percentages indicate that the great majority of American farmhouses do not have any refrigeration. An exception is Providence County in Rhode Island. The figures for laundry facilities show such wide variations that again it is impossible to draw any general conclusions except for individual localities. The preliminary reports on cooking facilities likewise are not complete enough to provide an adequate basis of judgment. The high percentages in the wood or coal stoves column indicate, however, that this is probably the most general method of cooking, with Knox County in Maine as an exception. Approximately one-tenth of the houses in Providence County, Rhode Island, and Snohomish County, Washington, have electric stoves.

6

REFRIGERATION, LAUNDRY AND COOKING FACILITIES

EXISTING FACILITIES (Approximate Percentages)

STATE	COUNTY	TABULATED FARMHOUSES	ICE BOXES	MECHANICAL REFRIGERATION	WASHING MACHINES, HAND	WASHING MACHINES, POWER	WOOD OR COAL COOKING STOVES	KEROSENE OR GASOLINE STOVES	GAS STOVES	ELECTRIC STOVES
ARKANSAS	Arkansas	2631	23	2	4	11	95	18		
	Faulkner	3370	10	4		1				
FLORIDA	Orange	1492	50	16	1	9				
INDIANA	Benton	1392	19	2	30	45	96	29		
KENTUCKY	Bourbon	1461	52	9	52	15	91	12	3	
	Boyle	973	29	42	64	36				
	Calloway	2792	12		97	1	97	7		
	Fleming	1907	26		91	5				
	Hardin	2642	12	12	93	4	98	15		
	Hickman	1426	31		87	3	93			
	Knott	2114	3		1	4	91			
	Ohio	2610	10		96	3				
	Shelby	2015	49	4	66	21				
	Simpson	1749	40		2	3	98	8	1	
LOUISIANA	Acadia Parish	3575	7	1			92	19		
	Beauregard	1371	15	2	2		99	7	1	
MAINE	Knox	1000	43	4	7	24	10	8		2
MINNESOTA	Stevens	1250	4	1	21	49	95	43		
NEBRASKA	Cuming	1770	9	2	16	78	99	26	1	
	Otoe	2093	25	5	26	63	98	37	1	1
NEVADA	Washoe } Churchill }	1056	31	8	2	30	75	8	3	7
N. CAROLINA	Cleveland	2871	25	1	1	2	97	2		1
	Duplin	2311	6		1		92	7		
OKLAHOMA	Beaver	1825	17	2	25	30				
RHODE ISLAND	Providence	1139	69	22	19	27	78	31	7	10
TENNESSEE	Knox	3357	34	2	1	6				
VIRGINIA	Rockingham	3346	41	5	23	23				
WASHINGTON	Snohomish	2041	3	2	6	48	96	1		11

5

LIGHT AND HEAT

EXISTING FACILITIES (Approximate Percentages)

STATE	COUNTY	TABULATED FARMHOUSES	KEROSENE OR GASOLINE LAMPS	GAS LIGHTING	ELECTRICITY, HOME PLANT	ELECTRICITY, POWER LINE	FIREPLACES	STOVES	CENTRAL HEATING SYSTEMS
ARKANSAS	Arkansas	2631	92	1	3	6	9	93	1
	Faulkner	3370	96			(5)	51	52	
FLORIDA	Orange	1492	57	2	6	42	50	46	5
INDIANA	Benton	1392	79	5	13	6	2	63	42
KENTUCKY	Bourbon	1461	76	6		(19)	50	43	24
	Boyle	973	87		2	11	51	75	10
	Calloway	2792	98		1	2	84	36	1
	Fleming	1907	94	1	4	2	52	73	8
	Hardin	2642	91	1		(9)	24	91	4
	Hickman	1426	98	1			41	71	1
	Knott	2114	92	2		(4)	88	3	
	Ohio	2610	97	2		(1)	76	36	3
	Shelby	2015	84	3		(15)			5
	Simpson	1749	94	3	1	3	70	61	2
LOUISIANA	Acadia Parish	3575	96	1		(4)	50	38	1
	Beauregard	1371	94	2		(5)	66	26	
MAINE	Knox	1000	48		2	50	4	90	25
MINNESOTA	Stevens	1250	90	1	7	3		64	36
NEBRASKA	Cuming	1770	69	2	25	6		64	41
	Otoe	2093	74	2	14	12	1	67	34
NEVADA	Washoe } Churchill }	1056	30	1		(70)		84	22
N. CAROLINA	Cleveland	2871	84	1	1	14	94	9	2
	Duplin	2311	95	2	1	3	89	16	
OKLAHOMA	Beaver	1825	89	8		(6)		77	18
RHODE ISLAND	Providence	1139	16	1	1	82		72	50
TENNESSEE	Knox	3357	81	4	3	14	71	45	13
VIRGINIA	Rockingham	3346	70	2		(30)		91	11
WASHINGTON	Snohomish	2041	16			85	8	73	18

Kerosene or gasoline lamps constitute the most general type of illumination for the American farmhouse, except in the localities listed for Washington, Rhode Island, Nevada and Maine, where electricity is largely available. Counties in Indiana, Minnesota and Nebraska report a larger number of farms producing electricity from home plants than those utilizing power lines, but the percentages are relatively low. (The preliminary government reports do not distinguish between the two types of electric power production in all cases, and in such instances the percentages have been recorded within parentheses in the power line column.)

Stoves appear to be the chief method of heating the American farmhouse. Considerable variation, however, exists between localities in the same state. Kentucky for example, where 3 per cent is shown for one county and 91 per cent for another. In the northern states fairly large percentages of the houses have central heating systems, whereas in the South the fireplace is a more important source of heat.



Photos, U. S. Dept. of Agriculture

1 Kitchen in home at Clarkston, Georgia.

4 Living room in home at Clarkston, Georgia.

2 Kitchen in home at Gaffney, South Carolina.

5 Dining room in home at Clarkston, Georgia.

3 An outdoor kitchen at Anderson, South Carolina. Lavatory for washing by farm hands.

6 Interior of negro cabin, Lavington Plantation, South Carolina. Walls covered with newspapers for insulation and decoration.

REPAIRS and IMPROVEMENTS DESIRED

Structural repairs apparently are more urgently desired than additional space or additional equipment. Interior walls, ceilings and floors, exterior walls, and roofs, are the most desired items of repair, as indicated by the generally prevailing high percentages in these columns. In the southern localities, particularly Louisiana and North Carolina, doors, windows and screens, and porches, are also important wants.

In most counties additional space is asked by the farmers, vying in importance with their desires for water systems and bathroom equipment.

Considering the need for improved sanitary facilities expressed in a preceding table, this item shows a comparatively small demand except in the counties in Louisiana and North Carolina.

Relatively little desire, on the basis of a limited spending sum, is manifested for lighting and heating systems, laundry and cooking facilities, and landscaping.

Furnishings, on the other hand, are a potentially important item of expenditure.

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REPAIRS AND IMPROVEMENTS DESIRED IF \$500 WERE AVAILABLE

(Approximate Percentage of Total Farms)

STATE	COUNTY	TABULATED FARMHOUSES	FOUNDATION	EXTERIOR WALLS	ROOFS	CHIMNEYS	DOORS, WINDOWS, SCREENS	PORCHES	INTERIOR WALLS, CEILINGS, FLOORS	ADDITIONAL ROOMS	WATER SYSTEM	SANITARY FACILITIES	LIGHTING SYSTEM	HEATING SYSTEM	BATHROOM EQUIPMENT	LAUNDRY FACILITIES	COOKING FACILITIES	LANDSCAPING	ELECTRICITY: HOME PLANT	ELECTRICITY: POWER PLANT	BUILT-IN EQUIPMENT	FURNISHINGS
ARKANSAS	Arkansas	2631	18	22	21	10	24	21	26	15	14				11							10
	Faulkner	3370	16	31	31		26	16	42	26	9	6			8	7						28
FLORIDA	Orange	1492		39	33	17	29	25	51	26	35	20	14		32					(15)	21	18
INDIANA	Benton	1392		13					14		17			11	20				5	13		14
KENTUCKY	Bourbon	1461	3	8	6	3	6	8	16	10	11		4		4					(6)		17
	Boyle	973		34	21		23	21	35	25	15							14				
	Calloway	2792	8	24	19		17	10	22	17	14				7					(14)		11
	Fleming	1907		4	3		3	4	3	5	4	2			2					(3)		
	Hardin	2642		14	11			9	11	9	12											9
	Hickman	1426	27	55	44	8	33	39	56	28	29					9			8		12	
	Knott	2114	25	38	45		48	26	56	46	36	18	15		10	14		30			16	56
	Ohio	2610		36	29		29	26	32	20	18				13							
	Shelby	2015		49	26		22	19	46	21	29				16			18		(17)		13
	Simpson	1749	8	41	28	8	28	27	42	27	44		11		28					(26)		16
LOUISIANA	Acadia Parish	3575	38	52	48		68	35	49	43	28	45										28
	Beauregard	1371	42	49	48	43	70	46	58	45	35	25			31							34
MAINE	Knox	1000	13	33	21				27	7	19		8		18							
MINNESOTA	Stevens	1250	13	13					24	16	23					16						19
NEBRASKA	Cuming	1770	13	23	12		13	8	24	19	26	11		7	27					(8)		
	Otoe	2093		17	10		10	10	22	14	27	23		9	22					(16)		11
NEVADA	Washoe Churchill	1056	14	21	19		13	18	31	29	34	18			37							18
N. CAROLINA	Cleveland	2871	19	50	33		53	34	58	34	32	72										22
	Duplin	2311	38	55	45	21	63	36	72	26	26	34										18
OKLAHOMA	Beaver	1825		11	10		7		13	11	10				9							
RHODE ISLAND	Providence	1139		29	13				27		18	11			18							10
TENNESSEE	Knox	3357		43	31		27	24	41	26	33	20			19			13		(18)		14
VIRGINIA	Rockingham	3346		18	7		10	20	13	22			13		20			13		(15)		12
WASHINGTON	Snohomish	2041	26	39	25		12	11	44	29	27				36							13

RESEARCH IN FARM STRUCTURES

BY HENRY GIESE

Senior Agricultural Engineer, Bureau of Agricultural Engineering,
United States Department of Agriculture.
Miscellaneous Publication No. 133, April, 1932. Pamphlet for
sale by Superintendent of Documents, Washington, D. C.
Price 15 cents.

According to the 1925 census, the total investment in farm buildings in the United States is \$11,746,629,000. The investment in each of eight States exceeds \$500,000,000. Land is the only larger item of investment on the farm. While accurate figures are not available, it is conservatively estimated that American farmers spend several millions of dollars daily upon the construction and repair of buildings. The annual farm fire loss is more than \$100,000,000 and to this economic loss must be added a yearly loss of 3,500 lives. Fire losses are truly economic losses and in the majority of cases are preventable. Repairs become necessary to take care of wear or the ravages of destructive agencies such as temperature, moisture, wind, and insects. Good farm management frequently involves remodeling of buildings. Farm buildings definitely influence agricultural welfare.

According to the 1925 census there are in the United States more than 6,250,000 farm units, but the average investment is relatively small. The individual farmer's interest in farm structures research is lessened by the long period of service generally obtained from his buildings. Not every generation builds a barn. In many cases, especially where materials have been readily available, buildings have been so substantially built as to last several generations and consequently remodeling to meet service requirements is a more acute problem than new construction.

Under present methods of merchandising the farmer does not buy buildings complete and ready for operation as he buys other equipment. He buys partially fabricated materials or builds from materials produced on his own farm. In either case skillful handling on the part of the purchaser is required. As construction specialists are not usually available, the buildings frequently are unsuited for their intended use and are not constructed in a way that will tend to reduce depreciation and repair costs to a minimum. The situation is altogether different from that in cities, where buildings generally are planned by trained architects, built by experienced contractors, and checked by building inspectors.

Proper construction of buildings necessitates a careful study of building methods. The requirements as to space and sanitation, and the conditions of air temperature, relative humidity, and rate of air movement, must be known before buildings can be well designed, and in meeting these requirements materials and labor must be used economically. New materials should be adapted to farm uses. Development of standard practices and simplification of construction methods would aid materially in securing better buildings. Much of the data now available for the design of farm buildings are based on tradition and probably are inaccurate.

The architectural profession in general has not as yet shown interest in developing farm structures. The small, scattered units have not proved profitable from a professional standpoint, and the architect has not seen the necessity for specific training in the design of farm buildings. The farmer usually does not employ professional service, because he does not appreciate the importance of scientific design and is not convinced of the value of the assistance for which a professional charge is made. On the other hand he may be reluctant to accept recommendations from organizations that give free assistance in planning but that expect eventually to sell enough merchandise to cover their service costs. There is, then, a real need for constructive effort in research.

PLANNING THE FARMSTEAD

BY M. C. BETTS AND W. R. HUMPHRIES

M. C. Betts, Chief, Division of Plans and Services, and W. R. Humphries, Chief Engineering Aid, Bureau of Agricultural Engineering, U. S. Department of Agriculture, Bulletin 1132.

The main considerations influencing the determination of the farmstead site are its location with respect to the rest of the farm and to public utilities, the elevation and drainage of the proposed site, the available water supply, the nature of the soil, the relation to the points of the compass, the prevailing breezes and protection from heat and cold.

The planning of a farmstead involves arrangement of lots, yards, various buildings, driveways, with relation to each other, to the fields and to the highway. The arrangement should aid in executing the routine work of the farm with a minimum of time covered and with no retracing of steps.

DETERMINING THE FARM PLAN

It is not possible to develop a plan having general application, because the conditions to be met in each case vary.

The following factors influence the plan arrangement of the farmstead:

- TOPOGRAPHY OF LAND.
- CLIMATIC AND SOIL CONDITIONS.
- TYPE OF FARMING TO BE UNDERTAKEN.
- DIRECTION OF WINDS.
- RELATION TO HIGHWAYS AND TOWNS.

Important conditions in selection of a farm site may be mentioned:

- LOCATION OF FARMHOUSE IN RELATION TO PUBLIC UTILITIES.
- ELEVATION AND DRAINAGE.
- WATER SUPPLY.
- NATURE OF SOIL.
- ORIENTATION.
- PREVAILING BREEZES.
- PROTECTION FROM HEAT AND COLD.

Ease of access to the fields from the buildings is highly desirable, as otherwise loss of time due to inconvenience will be incurred.

Traffic is a source of considerable interest to the average farm family. The ability to observe at close range or to hail those passing on the road tends to promote social intercourse and participation in community affairs.

It is of great importance that the farmstead site have a slope, in one or more directions, sufficient to carry off surface water from about the buildings and yards. Good

drainage about the farmstead insures dry floors and comparatively dry paths and drive-ways, making it easier to get around in bad weather. FOR THIS REASON A KNOLL or HILLSIDE with MODERATE SLOPE SHOULD BE SOUGHT.

The garden, lawn, orchard and windbreak, constituting a considerable part of the farmstead, require a good and preferably light soil, while the ground occupied by the farm buildings may be the poorest land on the farm.

The points of the compass have an important bearing on the proper arrangement of the buildings in the farmstead. **ORIENTATION**

Sunlight is one of the most potent enemies of dirt and disease. Germs do not thrive in sunlight, and dirt is more readily detected in a bright, cheery room than in one that is dark and dreary. It is very desirable, therefore, that all shelters of human and animal life receive the utmost benefit of the sun's rays during the winter and of the cooling breezes in the summer time. The principle of orientation is the arranging of the various parts of a building so that this end may be attained.

If a farmhouse is situated near the road, it is generally best to place it four square to the highway, but if it is placed fairly well back, there is no reason why it should not be set at almost any angle in order to secure the best results.

As a rule, throughout the Middle West, the prevailing summer breezes are from the south, southwest, and west, although in certain localities topographic conditions may cause a variation from this generality. Cold winds and snow sweeping over the farm, unchecked by hills or trees, cause general discomfort.

**BREEZES AND
PROTECTION
FROM HEAT
AND COLD**

It requires a great deal more fuel to warm a house that is exposed than one that has a measure of protection. For this reason, it is desirable to select a site having a south and southeast slope, or one in which existing trees form a natural windbreak, as it requires many years to grow an effective protection.

If the locality is without hills or other natural windbreak, a shelter belt of trees should be planted to the north and west of the farmstead. The trees should be selected with reference to nativity, height, denseness and rapidity of growth, ability to resist wind, and commercial value. It is a good plan to plant rapid-growth trees of the less desirable varieties along with permanent planting. In this way, protection is secured quickly, and when the hardier trees have acquired growth, the others may be cut out. The permanent planting should include a goodly proportion of evergreen trees. Evergreens, however, should not be planted so near the house as to cast a shadow upon the window area during the winter months.

Shrubs planted so near the house as to hinder the entrance of the sun's rays into the basement rooms, also should be avoided.

During the summer months barnyard odors are an annoyance. If the outbuildings are placed to the north or east of the dwelling, the prevailing breezes will carry the odors away from the house. Relief from summer heat is best provided for by permitting the cooling

breezes from the south and southwest to sweep unchecked through the farmstead. The dwelling should be so planned that principal rooms will receive the benefit of these breezes.

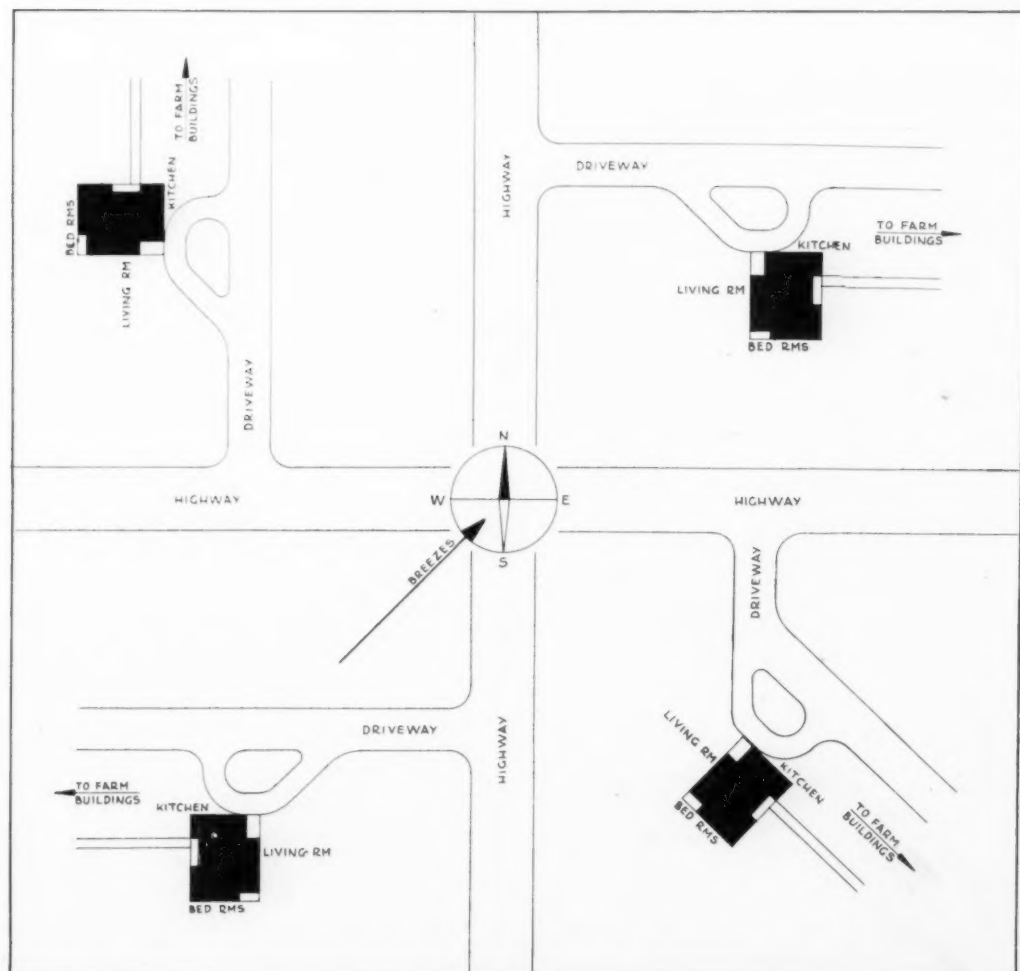
A moderate amount of shade should be provided, especially near the house, since it prevents radiation of heat from the ground, which is perhaps a greater source of discomfort in the house than the direct rays of sun on roof and walls.

DIAGRAM SHOWING LOCATION OF FARMHOUSE either north, east, west or south of the highway. In every case the house is situated in relation to the driveway and the other farm buildings so as to avoid the carrying of dust or barnyard odors towards the house by the prevailing breezes.

Living room and main entrance face the highway.

Bedrooms are arranged to get most benefit of the summer breezes from the southwest.

The kitchen overlooks the driveway and barnyard to give the housewife control over the approach to the farmstead and the other farm buildings.



PLANNING THE FARMHOUSE

PLANNING THE WILLAMETTE VALLEY FARMHOUSE FOR FAMILY NEEDS, BY MAUD WILSON, AGRICULTURAL

A ONE ROOM FARMHOUSE INTERIOR IN THE OZARK MOUNTAINS, MISSOURI; USED FOR DINING, SLEEPING, COOKING AND SITTING. A COMMON FORM OF FARM DWELLING IN LOCALITIES THAT AFFORD MEAGER INCOME.



Falloway

FOR FAMILY NEEDS

EXPERIMENT STATION, OREGON STATE AGRICULTURAL COLLEGE, CORVALLIS, OREGON, BULLETIN 320

The farm family must usually make the best of its housing situation, for rarely is it possible to move to another farm for the sake of a more suitable dwelling. In planning the farmhouse, therefore, it is necessary to keep in mind that it must serve the needs of the family over a long period of time, and that it will probably shelter families of varying sizes during its period of use.*

Reading, listening to radio programs, and informal social life are the major home leisure activities of the farm family for which provision should be made in planning the house or its furnishings. The customary procedure is for homemakers to relieve the tedium of the routine tasks of sewing, mending, and ironing by listening to daytime programs, a fact to be considered in planning the location of the radio, the ironing board, and the sewing machine.

GENERAL REQUIREMENTS FOR THE FARMHOUSE:

A terrace or uncovered porch protected from winter winds but reached by the sun's rays at midday, to encourage children, elderly people and sick people to get out of doors on sunny days in winter.

An open porch or uncovered deck on the second floor, as a place to air bedding and to place beds in warm weather.

Steps between ground level and first floor. These should be avoided where possible by grading the back yard and by using gently sloping nonslippery walks.

Over-protection of windows. Outside protection of windows is seldom necessary. If considered desirable in a particular situation, use awnings which can easily be raised or lowered or easily reinstalled or removed for the season. Opaque window shades. Many windows require no shades at all. Venetian blinds are desirable for windows in some situations, translucent shades in others.

DESIRABLE ARRANGEMENTS:

Four well-defined play areas for small children:

1. In the house.
2. Out of the house but under cover.
3. In the sunshine but on a surfaced space.
4. Out on the ground.

Kitchen windows located so as to overlook the children's outdoor play center. Floors that are warm and easily kept clean.

*This article developed from "Planning the Willamette Valley Farmhouse for Family Needs," by Maud Wilson, Agricultural Experiment Station, Oregon State Agricultural College, Corvallis, Oregon, Bulletin 320.

A well equipped — but poorly planned — kitchen.
Laundry in kitchen is undesirable.



Gallotway

Downstairs bathroom adequately planned for the care of children.

Toilet facilities readily accessible from the back door and the kitchen.

A bed for each child.

A clothes closet for each child.

Low hooks, shelves, drawers, and racks for clothes.

Adequate and readily accessible storage for play supplies and equipment in current use.

Storage of unused or reserve toys in places not readily accessible to children.

Dining chairs suited to the child's needs as to height; foot rests provided where feet do not rest on floor.

Chairs, tables, desks, and other articles used exclusively by children suited to the heights of the users.

Stepping stools near lavatory, toilet, and high window sills.

Shelves for drinking glasses in kitchen and bathroom.

Space units for the two-story house. Following is a list of the space units suggested for the "whole-family" farmhouse.

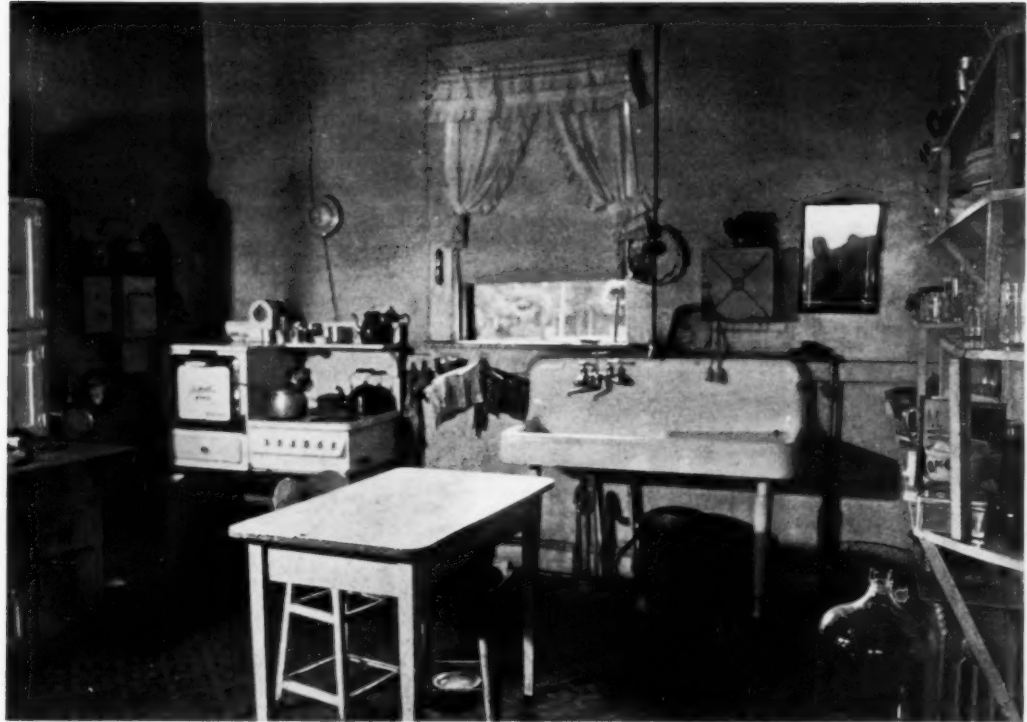
**FIRST FLOOR,
BASEMENT, OR
ADJACENT
BUILDING:**

Auxiliary work areas and storage rooms for equipment, supplies, and products.

Men's wash room.

Storage space for work clothes.

Good equipment with unsatisfactory disposition. Walls are cluttered with utensils that should be in closed cabinets. Open shelving at right undesirable. Wall counter space near stove and sink needed. Radiator should be placed under window.



**FIRST FLOOR OR
BASEMENT
PLAN:**

Area required for heating plant.

Storage for fuel for heating plant, stoves, fireplace.

Winter storage for screens, outdoor play and living equipment, and in some cases for yard and garden tools.

**FIRST FLOOR
PLAN:**

Kitchen, used for work with foods and service of everyday meals, and in some cases for ironing.

Bedroom, with one or two closets.

At least two other rooms, serving purposes of second bedroom, living room, dining room, office, child's playroom, sewing room, and in some cases for ironing; closets to supply the storage space needed in connection with these functions.

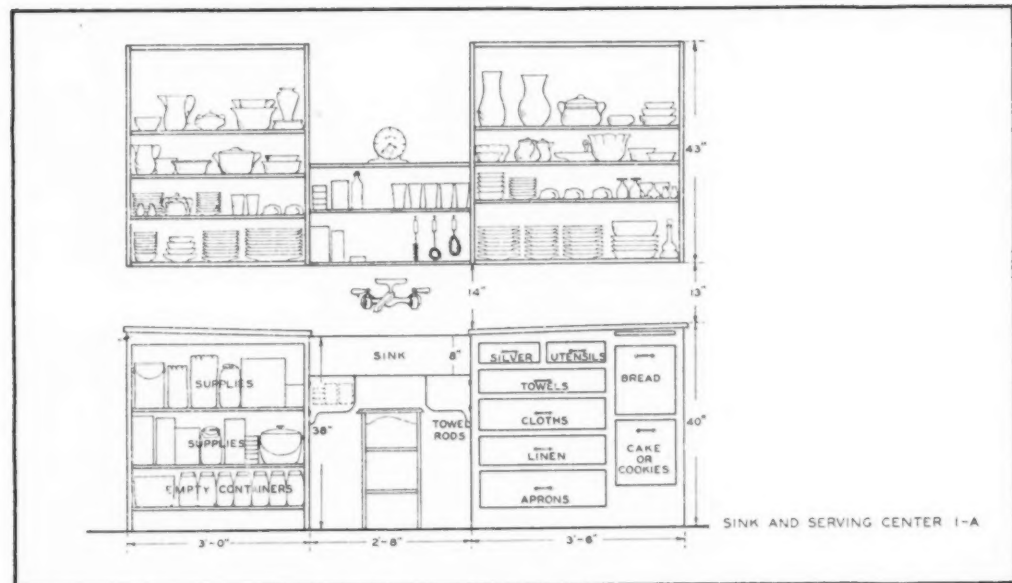
Toilet facilities.

Vestibule for front entrance.

Central hall, connecting bedrooms, bath or toilet, stairways, outside entrance leading to drive or farm buildings, kitchen, and either the living room or the dining room.

Closet for cleaning equipment and supplies, opening preferably from the central hall.

Sink and serving center for farm kitchen. See discussion on this page.



Closet or open space for outer garments in frequent use.

SECOND FLOOR PLAN:

Two or more bedrooms, each with clothes closets, preferably one for each person occupying the room.

Bathroom.

Hall, connecting bedrooms, bathroom, and stairway to the first floor.

Bedding closet opening into the hall.

Storeroom for unused furniture, trunks, and other bulky articles.

Storage for cleaning equipment used on the second floor.

One or more deck or open porch.

GRADE LEVEL AND HOUSE SURROUNDINGS:

Storage for equipment used about yard and garden during the growing season.

Drying lines.

Children's play center.

ARRANGEMENTS DESIRABLE FOR KITCHENS:

Kitchen dining table on the same side of the work area as the door to the dining room or the living room.

Work centers not separated by doors.

"Cooler" close to worktable and to sink-and-serving area.

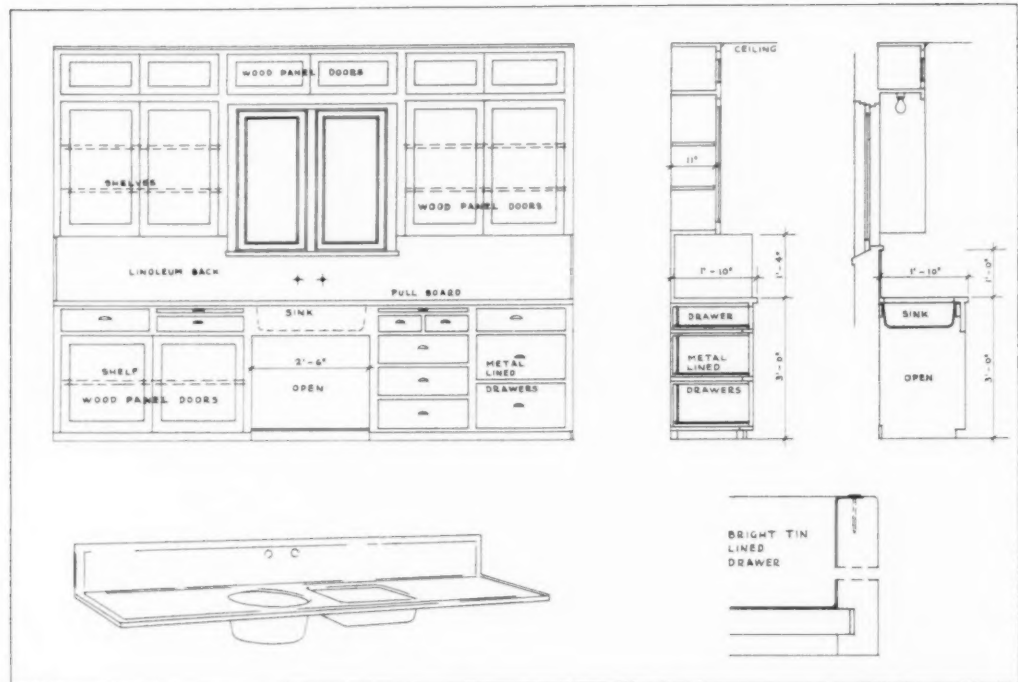
Refrigerator close to worktable and serving area.

Stove between sink and worktable units.

Sink and worktable units opposite each other.

Built-in kitchen cabinet suited to farmhouse proposed by Division of Agricultural Engineering, University of California.

A two-compartment sink is shown at lower left of illustration. It is of stamped steel, enameled and simplifies washing and drainage of dishes and cleaning of vegetables.



Sink and serving units combined so that the serving counter may also be a drain board.

Sink and serving unit adjacent to dining area of kitchen.

Serving unit on partition between kitchen and dining area so that a pass cupboard may connect the two.

Articles of equipment stored near the place where they are used.

Supplies that do not deteriorate unduly in room temperature, stored near point of use.

"Cooler" space large enough to provide for the storage of all supplies requiring a temperature lower than that of the room.

Wall space for a small mechanical refrigerator in addition to the cooler.

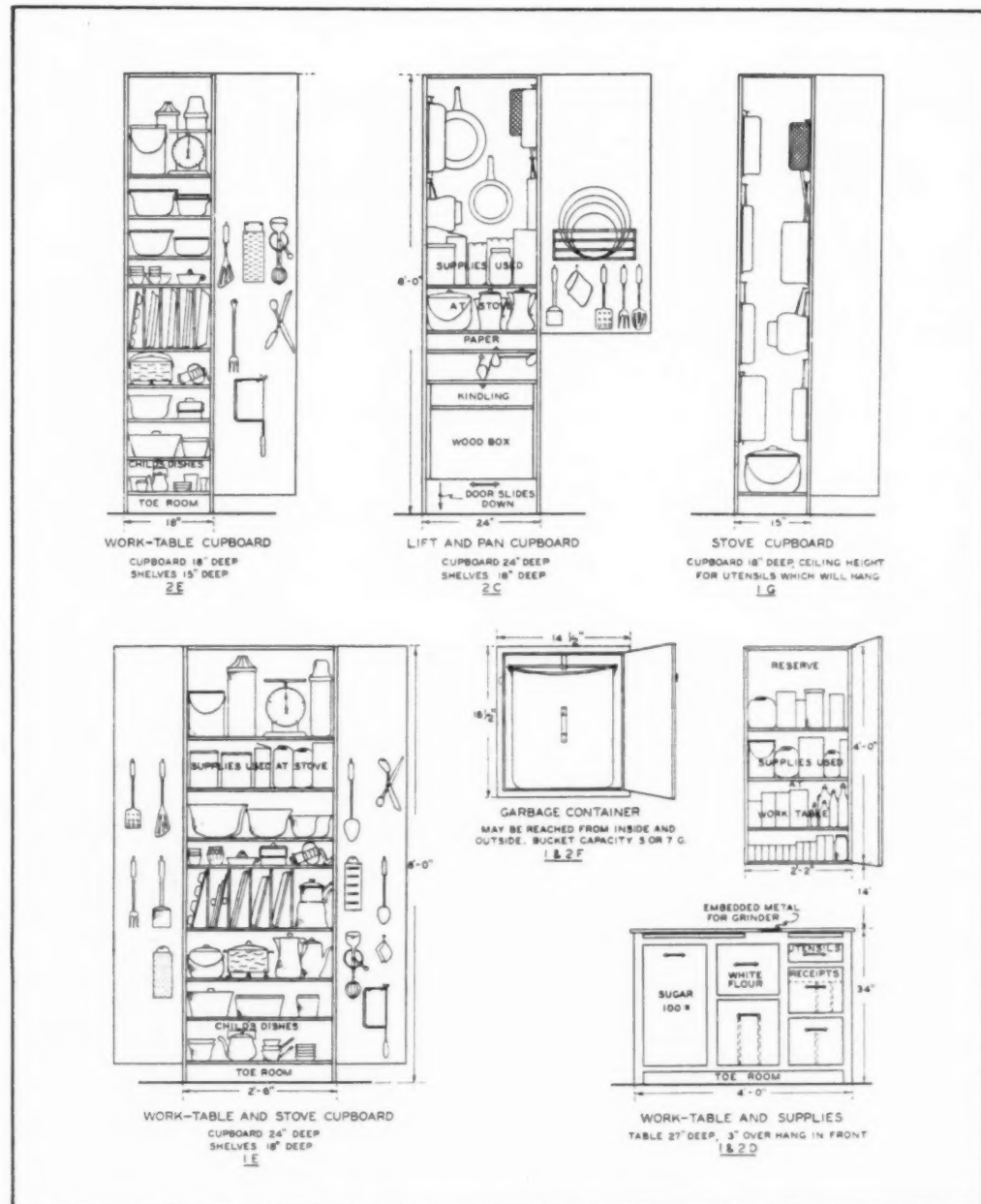
"Cooler" made so that it can be easily removed to permit installing a large refrigerator.

A narrow cupboard reaching from floor to ceiling and with hooks on the sides, for large articles which will hang.

Space in the utensil cupboard which is divided vertically to form slots for holding lids, pie tins, and shallow pans.

Drawers coated on the inside with paraffin, and sectioned to provide bin space for cereals purchased in five-pound or ten-pound lots.

Work-table and cupboards for kitchen showing location for supplies. See discussion on page 316.



Wall space large enough for a combination wood and electric or gas stove, together with space to stand at sides of the stove.

Depth of stove area sufficient to permit setting the stove away from the wall for ease in cleaning.

Where the combination stove is not used, a cabinet adjacent to the stove having its top on a level with the stove and covered with a material not harmed by hot kettles.

A place near the stove large enough to hold a day's supply of fuel; this may

An orderly and convenient kitchen. Equipment is well arranged. House for J. Victor East, Longmeadow, Mass.



Van Anda

be a woodbox with cleanout below, or it may be a wood lift with a door which drops down to make the contents readily accessible.

Compartments in sink which permit washing and draining dishes without use of pans.

Shallow cupboard above sink for drinking glasses, cleaning powders, hand lotion, etc.

Built-in garbage container accessible from both inside and outside the house. Provision for a stool to be used at the sink.

Stepping stool just high enough to make the upper shelves accessible.

All storage spaces closed.

Roller-shades used on cupboards instead of doors.

Results of the study to date indicate that more storage space is needed for equipment and supplies in the kitchen than is possible to arrange above and below drain boards and worktable surfaces, without increasing their length beyond that needed for their respective functions. The best way to accommodate this overflow is to provide storage cupboards reaching from floor to ceiling. Where the stove is placed between sink and worktable, one of these can be a worktable-stove cupboard while the other can be a sink-stove cupboard. It is a common practice among farm families to feed edible garbage to animals. Both kitchen plans appearing on Plate I show a built-in garbage container that can be reached from the outside as well as the inside. This container is designated as I and 2F on page 318.

A cooler large enough to care for all the supplies it is desired to store at a temperature lower than that of the room will need to be 2 feet wide if it is 18 inches deep.

AUXILIARY WORK AREA:

The term "auxiliary work area" is used to designate an area devoted to work it is desirable to do under the house roof but outside kitchen and living rooms. The purposes which this area will serve vary in different households, but they may include washing; ironing; preparing fruits, vegetables, meats, and fish for cooking, canning, or curing; processing canned foods; packing eggs; making soap; dressing poultry for the market; cleaning, oiling, and repairing shoes; mixing paint and caring for paint brushes; working with guns and other sports equipment; working at a carpenter's bench or metal lathe; transplanting house plants and starting bulbs and seeds; separating milk; washing milk utensils; setting incubators. Storage room will need to be provided for canned fruits, vegetables, and other preserved foods and for those produced for market, and for supplies and equipment used in doing the various kinds of work assigned to the area. It is well also to provide toilet facilities nearby.

The first floor is probably the most satisfactory location for this work area, but use of the basement has the advantage, besides possible economy in building costs, of having a necessarily unattractive section of the house out of sight of the drive and of the living rooms. In situations where the new house is built near the old one, the latter may be converted into an auxiliary work

area, and connected with the new house by a covered passage having a wall on the side from which storms come.

Since the operations performed in the auxiliary work area will vary from time to time, it is well that arrangements be highly flexible. Only such partitions should be planned as are required for privacy or for desirable differences in temperature and the area should be so planned that each part of it is suited to the greatest possible number of uses.

**FEATURES OF
AUXILIARY
WORK AREA:**

An insulated and ventilated room for canned products and other preserved foods.

Flue for use of stove when desired.

Windows sufficient for light required for work in daytime.

Floor impervious to water and easily cleaned.

Entrances conveniently located with reference to kitchen and farm buildings.

Drive planned to make it possible to bring heavy articles to entrance of auxiliary area in wheelbarrow or truck.

Room allowed for use of a table as large as 3 feet by 8 feet near sink and stove.

A cabinet provided with some means of forcing the circulation of warmed air, for use during the rainy season in drying the wash.

Basement walls waterproofed and kept whitewashed.

Stairs that are easy to climb.

An outside as well as an inside stairway if both are needed for ready access to kitchen and farm buildings.

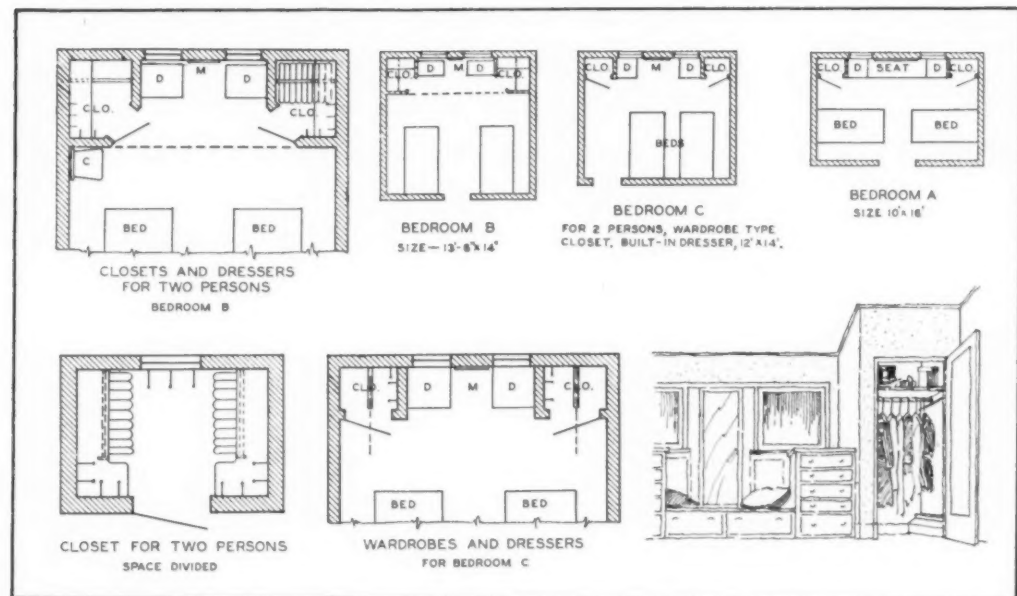
Chutes and lifts provided where possible, to eliminate carrying equipment and supplies. It is sometimes possible to arrange a lift opening on the outside of the house on a level with a truck bed, for convenience in handling egg cases, hog carcasses, etc.

A stairway that is broad and straight and is entered from the end, where equipment and supplies must be carried to the basement rather than transported by means of a lift.

DINING AREAS:

It is desirable that arrangements for the location of dining areas be made flexible because preferences of farm families in this regard vary from time to time. Elderly people and homemakers whose children are small commonly prefer the kitchen as the place for serving family meals. Where there are children old enough to set the table and wash the dishes, a dining area outside

Clothes closets and dressing centers. See discussion on page 323.



the kitchen may be preferred.

The outside location is always desired for company meals. This area may be a separate dining room or it may be combined with the living room. It is a more usable area if separate.

A porch where meals may be served in warm weather is popular. Crews of men may be served here.

The requirement of flexibility makes it necessary to plan for the storage of dishes, silver, and linen with reference to the various locations of the dining table. A good plan is to store all articles in the kitchen except the silver and linen used only in connection with company meals.

A buffet is a desirable article of furniture for use in serving company meals. Drawers below provide adequately for the silver and linen not used every day.

DESIRABLE ARRANGEMENTS FOR SERVING MEALS:

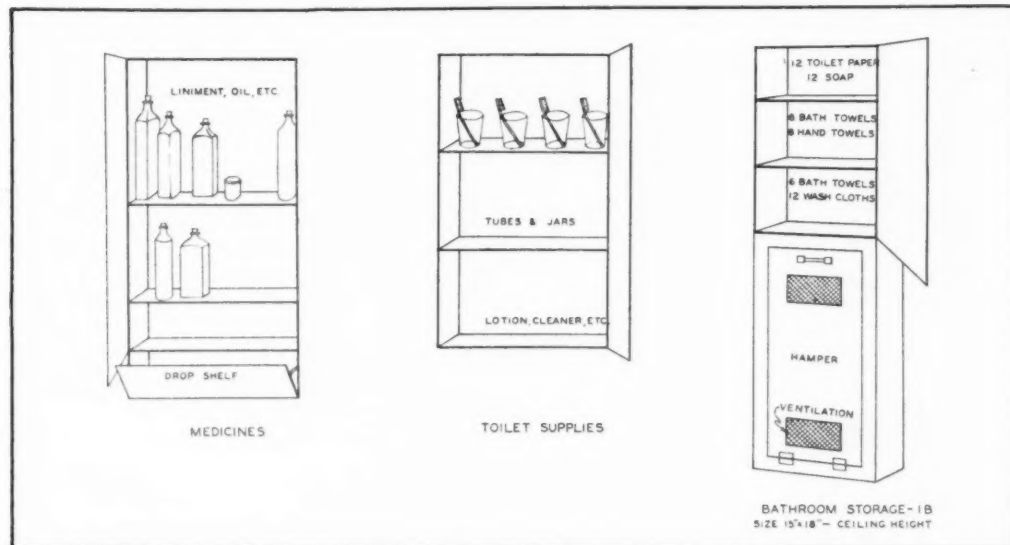
If the company meal is served in the living room, an area so situated as to make it possible to screen the table while it is being prepared for a meal.

Where everyday meals are served in the dining room, distance between dining table and serving area of kitchen as short as possible.

The table used for everyday meals so placed that it does not require moving, in setting it for a meal.

The kitchen dining table so placed that it can be reached from the living room

Diagram showing bathroom cabinets and location of needed supplies.



without crossing the work area of the kitchen.

A special low table for the child of less than three years of age.

Where benches are used, lightweight movable single benches with handholds are preferable to fixed benches seating more than one person.

SLEEPING AND DRESSING AREAS:

The problem of heat conservation is of very great importance in connection with provisions for sleeping and dressing. The rooms are not used a great deal during the day except as places in which to dress, and most farm dwellers prefer sleeping in cool rooms. Hence, in most cases only enough heat needs to be furnished to keep beds dried out and to make the rooms comfortable for use while dressing.

It would seem, therefore, that an economical arrangement for a second-floor room would be to plan a clothes closet large enough for use as a dressing room and equipped with an electric heater. If this were done, the bedroom would need to be only large enough for beds and a small table.

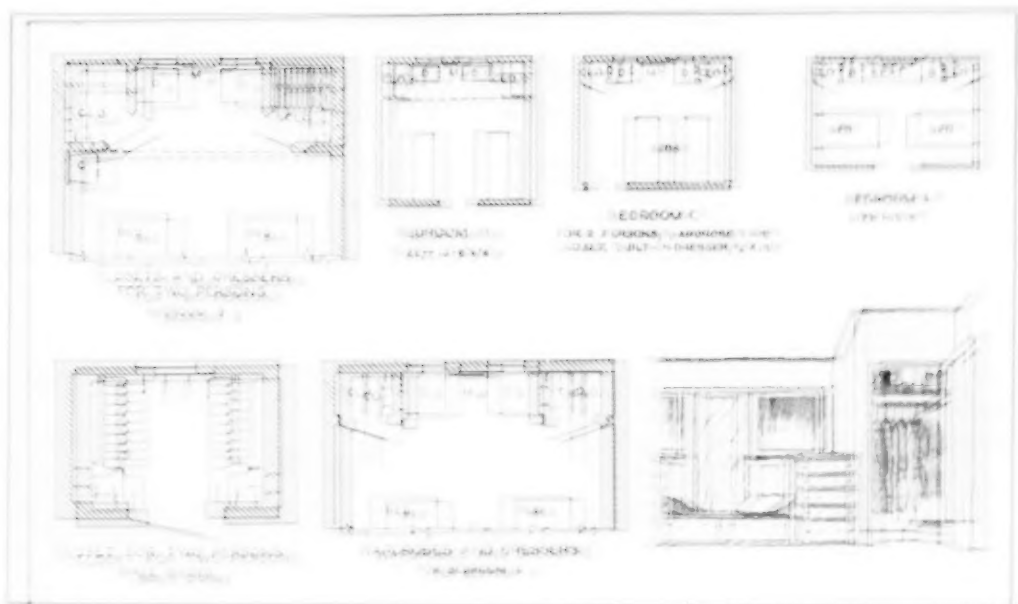
PLANNING FOR CONVENIENCE:

Space in each bedroom large enough for two beds each 40 inches wide. Decks or open porches, as places where older boys and girls may sleep out in summer.

Space at both sides of the bed, and passage at the foot.

A double closet, or preferably two single closets, for each bedroom.

A full-vision mirror with nothing in front of it.



The kitchen may be preferred.

The outside location is always desired for company meals. This area may be a separate dining room or it may be combined with the living room. It is a more desirable area if separate.

A porch where meals may be served in warm weather is popular. Owners of men may be served there.

The requirement of durability makes it necessary to plan for the storage of dishes, silver, and linen with reference to the various uses of the dining table. A good plan is to store all articles in the kitchen except the silver and linen used only in connection with company meals.

A buffet is a desirable article of furniture for use in serving company meals. Drawers below provide adequately for the silver and linen not used every day.

DESIRABLE ARRANGEMENTS FOR SERVING MEALS:

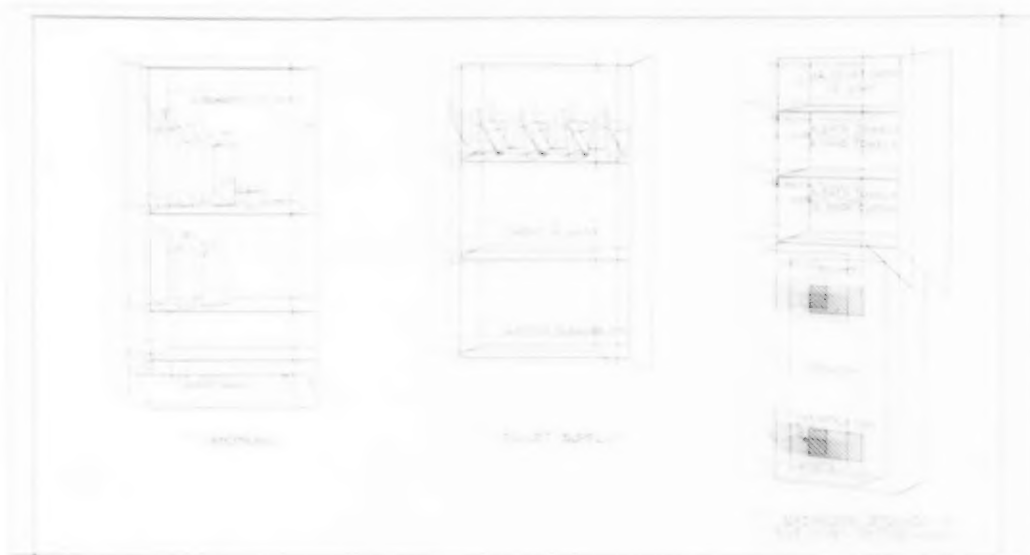
If the company meal is served in the living room, an area so situated as to make it possible to screen the table while it is being prepared for a meal.

Where everyday meals are served in the dining room, distance between dining table and serving area of kitchen as short as possible.

The table used for everyday meals so placed that it does not require moving in setting it for a meal.

The kitchen dining table so placed that it can be reached from the living room.

Figure 10. Second-floor plan of a small house with a second bathroom.



without crossing the work area of the kitchen.

A special toilet for the children, of less than three years of age.

When a person is a used light weight movable single benches with handholds are preferable to fixed benches seating more than one person.

SLEEPING AND DRESSING AREAS:

The problem of sleep conservation is of very great importance in connection with provisions for sleeping and dressing. These rooms are not used a great deal during the day except as places in which to dress, and most farm dwellers prefer sleeping in outdoor rooms. Therefore, in most cases, only enough heat needs to be furnished for a few hours of use at night and to make the rooms comfortable for use while dressing.

If we could save, therefore, a suitable economical arrangement for a second-floor room would be a toilet, a closet, a large enough room for use as a dressing room and equipped with an electric heater. If this were done, the bedroom would have to be only large enough for beds and a small table.

PLANNING FOR CONVENIENCE:

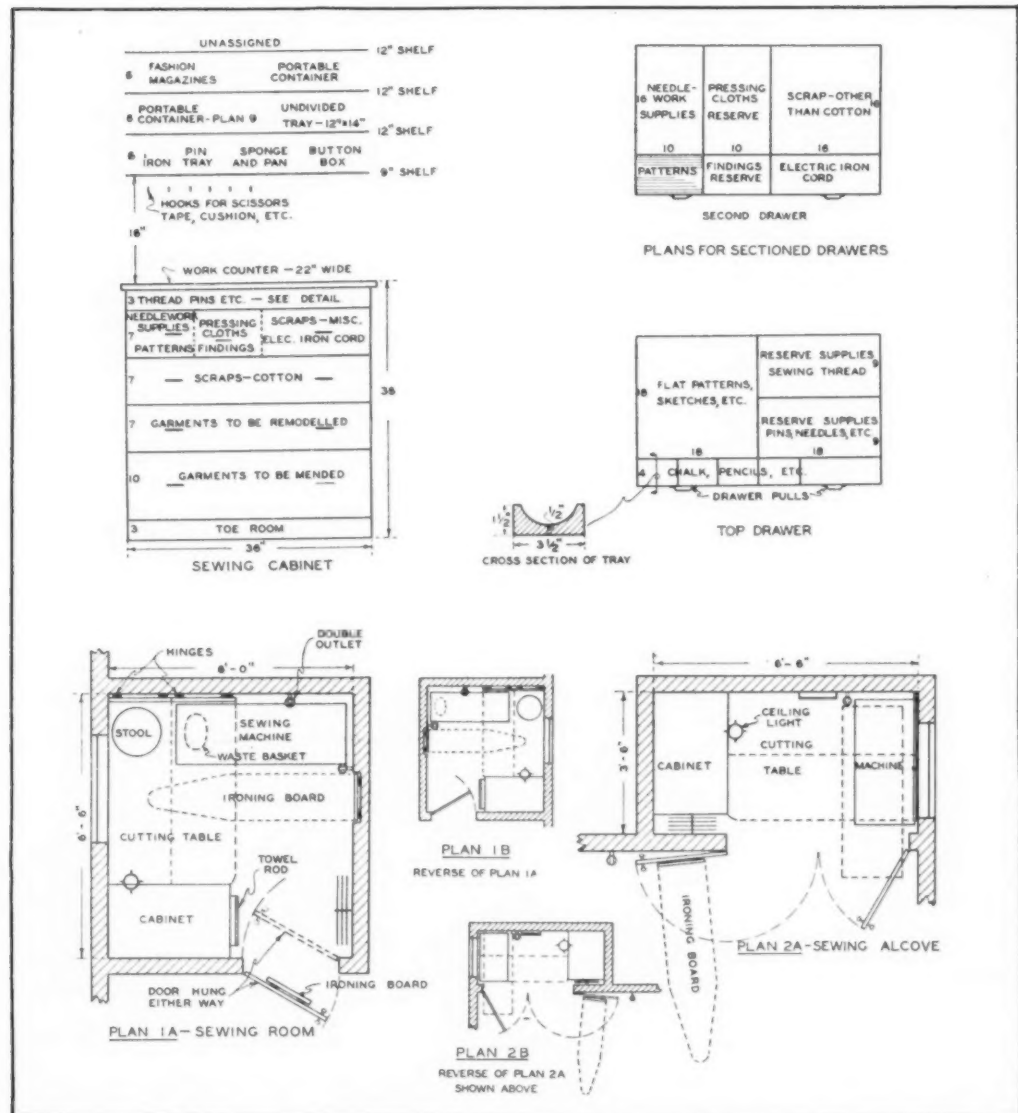
Spaces in beds have doors to the outside on each side, each 40 inches wide. Doors are open, however, in places where old men, women and girls may sleep but in summer.

Spaces at the bath doors to the outside and passage at the foot.

A double closet for each bedroom with single closets for each bedroom.

A full size mirror with dressing in front of it.

Floor plans for small sewing room and alcove.
Storage cabinet for supplies and minor equipment. See discussion on page 325.



Rod space sufficient to care for dresses, coats, dress shirts, and heavy sweaters.

Hooks, rod, and shelf capable of being set at three heights, for use by children at various ages.

Ventilation of windowless closets accomplished by means of ventilators in door. Clothes of children not old enough to dress themselves, kept on first floor.

A bathroom on the first floor, located near the back entrance; toilet in a separate compartment; bathroom equipped for care of small children and for use as a dressing room; fixtures including tub and shower and lavatory with separate section for care of teeth; storage provided for toilet supplies and equip-

ment, towels, and articles used in the care of small children; mirrors located for convenience in shaving and for use by children.

**MINOR
CONVENIENCE
ARRANGEMENTS:**

A table surface at least 14 inches by 18 inches near the lavatory.

Drawers or shelves for toilet articles and shaving equipment.

Storage in or near the bathroom for towels and supplies of soap and paper.

A built-in cabinet which provides a foot rest and a place for storage of shoe-cleaning equipment; this may be a section of the main cabinet, or it may be fitted in between studs.

A ventilated cabinet containing rods for towels in use and a place for wet brushes and cloths.

A cabinet top at least 18 inches by 36 inches for use in the care of an infant, or a wall surface permitting the use of a table for this purpose.

A place near the bathroom for the storage of supplies and equipment used in cleaning the bathroom.

A dental fixture; this may be purchased as a separate fixture or as a part of the lavatory.

A place for a mirror in front of a window or between two windows, with no obstruction in front of it.

Recess in wall for installation of electric heater when desired.

A shelf near the lavatory large enough for drinking glasses for all persons using the bathroom.

Hand-holds at back and left end of tub. It should be possible to reach a hand-hold from a sitting position in the tub and also from a position outside the tub.

A bathroom stool with a revolving seat.

Outlet for use of electric hair clipper.

**SEWING,
MENDING, AND
IRONING:**

Plans for locating sewing and ironing:

Plan 1. Sewing done in living room or dining room. A closet or alcove in connection which contains storage cabinet; work surface for basting, pinning, and cutting small pieces; place to store machine when not in use; dress form; folding clothes rack; portable cutting table.

Plan 2. Minimum-size sewing room, with machine in position for use at all times. Ironing done outside room.

Plan 3. Suitable for use in a home where guests are infrequent. Combination sewing room and spare bedroom; two closets—one for sewing, the other for a

**ARRANGEMENTS
FOR SEWING,
MENDING, AND
IRONING:**

roll-away bed.

Plan 4. Suitable for a family which includes boys and girls of high school age or older. Valet room in which all sewing, pressing, and ironing are done.

Room readily converted to other uses.

Storage room in one place for all supplies and minor equipment used in sewing. This may be a chest of drawers with open shelves above it for boxes, baskets, trays, etc.

Machine stored when not in use in a place where it is possible to get at it readily for emergency mending.

Work surface, available at all times, which is convenient for basting, pinning, and cutting small pieces, preferably located in a place where work can be left undisturbed between periods of sewing.

Work surface for use in laying out commercial patterns on lengths of goods. Use of such a surface would be infrequent, hence it can be a folding table or one used for other purposes.

Ironing board located near sewing area and in a position where it is in readiness for use while sewing is in progress.

A mirror conveniently located and of such dimensions and location as to provide a full vision for the person who is being fitted.

Sewing machine provided with an attached electric light.

Machine placed so that light from the window will come from back and left side of worker.

Portable containers for equipment and supplies used in hand sewing and darning.

**ARRANGEMENTS
FOR CARE OF
FARM
BUSINESS:**

Satisfactory arrangements fall into three groups:

Scheme 1. No provision for interviews.

Writing done at dining table or library table.

Storage provided by means of portable cabinets or wall closets.

Scheme 2. Office desk provided for use of farm operator.

Desk located in living room or dining room.

Supplementary storage provided in portable cabinet or wall closets.

Scheme 3. Separate office room, including office desk and built-in cabinets for supplies and for the use of employees. It may be desirable to make this room somewhat larger than required for office purposes alone, in order that it may be possible to use it as a "man's room" or second living room.

The office room, or the office area of the living room or dining room, should be

located so as to be readily accessible from the farm drive and farm buildings. It should be possible to enter it without crossing any of the living area of the house.

If an office room is provided, it should have an entrance which is readily accessible from the kitchen, for the convenience of the home-maker who is expected to answer the telephone and take care of part of the farm business. In certain locations two entrances are necessary.

The telephone. Although the wall type is in general use in farmhouses at the present time, it is likely that it will be supplanted eventually by the desk type. Arrangements for the telephone should be made with this possibility in mind. The telephone should be located away from the center of family life but near the kitchen, and in a place convenient for a person coming in from outside. The bell box should be placed where the bell can be heard from all parts of the house. (Extra wiring may be needed.) Suggested locations are in an alcove off the back hall; in the wall between the back hall and the kitchen and accessible from both sides; or in the wall of the office at the point most accessible from the kitchen. A good size for the alcove is 28 inches wide and 18 inches deep.

Convenience in the use of a telephone installed at standing height is enhanced by the provision of a writing shelf with light above it, and by a platform or low stool for the use of the shorter persons in the family. If the telephone is installed at sitting height, a desk or shelf should be provided in connection. A good size for a rectangular shelf or desk is 16 inches by 28 inches. A corner one will need to extend 28 inches on each wall.

Halls and entrances. There are four essentials in the planning of the front entrance of a house; adequate protection for the door, a vestibule of adequate size, a coat closet, and a seat to be used in removing overshoes. A roof or porch should extend over the door far enough to afford adequate protection from the rain. On the stormy side this roof will need to be at least 3 feet 6 inches wide if there is no side wall. If the seat is outside the house, it should be so located as to be protected from rain.

The vestibule should be of such proportions as to permit a guest to pass her hostess while the latter closed the door; a convenient plan is one which provides a minimum of 30 inches between one side of the door and the wall, and a minimum depth for the vestibule of 24 inches more than the width of the door, making a room 5 feet by 6 feet 3 inches. The vestibule should be at least

4 feet wide, and a room of this width will need to be 9 feet 6 inches long.

A study of the manner in which halls are used by the family shows the desirability of planning a house so that traffic areas ramify from a central stem. The base of this stem is the entrance leading to the farm drive and the farm buildings; the stem itself is a hall connecting this entrance with the portions of the house that are in constant use. These include the kitchen, living room or dining room, downstairs bedroom, entrance to the basement, and entrance to the second floor. It is desirable to locate in or adjacent to this hall a coat rack or closet for the use of the family, a telephone niche, alcove, or booth, a cleaning closet, and a cabinet for the storage of sports equipment. The telephone and the sports-equipment cabinet may be located in the office, if such a room is included in the floor plan.

BASIC DIMENSIONS:

Certain dimensions are used in determining areas in many different parts of the house. Some of the more important general dimensions are listed below, while those used chiefly in the planning of specific areas are listed in the following sections.

ENTRANCES:

Quarter or half circle, as determined by width and location of door.

PASSAGES:

Between pieces of furniture of less than elbow height—

To permit a person to "edge" through, 15 inches.

To permit a person to walk through naturally, 18 inches.

Between wall or high furniture and piece of less than elbow height, 21 inches.

Between wall and high furniture, 24 inches.

SEATING:

Depth of space needed for knee and foot room in front of straight chair, 20 inches.

Minimum width of space occupied by seated person (as between legs of table), 15 inches.

STANDING ROOM:

No action, 18 inches.

Working at drawer, depth of area 24 inches to 27 inches.

REACH:

Maximum height of shelf from floor, 72 inches.

Distance between centers of drawer pulls, 20 inches to 24 inches.

STOOP, BEND OR CROUCH:

Depth of area, 36 inches.

ARM MOVEMENT:

Width of area varies from 24 inches to 34 inches, depending upon extent to which entire arm is used.

**KITCHEN
DIMENSIONS:**

In planning the kitchen, the size of certain structural units to be accommodated must be considered as well as the floor area itself.

STRUCTURAL UNITS:

Depth of mixing table, 27 inches.

Width of part of mixing area unobstructed by cupboard above, 24 inches.

Distance between counter and first shelf of upper cupboard, 14 inches.

Depth of stack-and-drain surface, 24 inches.

Length of counter for draining and drying dishes, 32 inches.

Length of counter for stacking dishes, 36 inches.

Minimum distance between left of sink and wall or counter, 24 inches. (Place for person wiping dishes.)

Maximum height from floor to shelf intended for articles frequently used, 72 inches.

MARGINS ABOUT ARTICLES STORED (FOR FREEDOM IN ACTION OF HAND):

In front of article stored on shelf, 2 inches.

Between article and shelf above, 3 inches.

Between a hook and the lower edge of an article hung above it, 3 inches.

Between the backs of utensils hung on the side walls of a cabinet, 4 inches.

Minimum width of pass-cupboard opening, 14 inches.

FLOOR AREAS:

Minimum width of space between two centers, 48 inches.

Space in front or at side of open oven door of wood stove, 30 inches. (Measure taken from edge of door when open.)

Space in front of wood lift (if below counter), 36 inches.

Space before drawers—

For pulling out the drawer, 6 inches less than depth of counter or table (if drawer occupies its entire depth).

For standing in front or at the side of drawer, 21 inches.

DINING AREAS:

Space required for occupied seat or nonmovable seat: Since the front edge is on a line with the edge of the table, this measure depends on the floor area required by the seat itself. 18 inches by 18 inches is a common measure.

WIDTH OF PASSAGES:

Between front of seat and edge of table when seat is drawn back—

To permit person to take own seat, 9 inches.

To permit person to pass to seat beyond, 12 inches.

Between corner of table and corner of adjacent article of less than elbow height, 15 inches.

Back of occupied seat and article of furniture of less than elbow height—

For person passing to seat beyond, 15 inches.

For person serving table, 21 inches.

Back of occupied seat and wall or article of furniture of more than elbow height—

For person passing to seat beyond, 18 inches.

For person serving table, 24 inches.

- BEDROOMS—** Width of space at side of bed, for convenience of person making it, 20 inches.
Width of passage at foot of bed, 20 inches.
- CLOTHES CLOSETS—** Length of rod space per garment—
Street and house dresses, $1\frac{1}{2}$ inches.
Dinner and evening dresses, 2 inches.
Coats, fur-trimmed, 6 inches.
Coats, other, 4 inches.
Distance between hooks, 9 inches.
- TOILET FACILITIES—** Area in front of tub required for persons stooping or kneeling while helping child with bath:
Depth of area in center, 30 inches.
Distance from end of tub to adjacent fixture or piece of furniture 18 inches in depth, not less than 8 inches.
Area about toilet required for person, child or feeble person (measured from center of front edge of back of seat):
Depth, 30 inches.
Distance to adjacent fixture or other obstruction at right of toilet, 30 inches.
Area about lavatory (measured from the center of the bowl, laterally, and on a line with the fronts of the faucets):
Distance to adjacent fixtures or other obstructions more than 12 inches in depth, at left, 20 inches (required by adult washing own hair); at right, 38 inches (required by person helping another to wash hair).
- SEWING ARRANGEMENTS—** **CUTTING TABLE:**
Space between ends and adjacent wall or furniture, 2 inches.
Space in front for worker:
Length same as that of table.
Depth, 24 inches.
Size of table:
For all purposes, 42 inches by 108 inches.
For households where outer garments for adults are habitually bought ready-made, 38 inches by 72 inches.
Work surface for basting, pinning, and cutting small pieces, 22 inches by 60 inches.
Sewing machine—distances to walls or adjacent articles of furniture:
At left of machine, 6 inches.
At back of machine, 2 inches.
At right of machine, 1 inch.
- IRONING—** Space at open end of board, 6 inches.
Space at back of board, 6 inches.
Space for worker:
Length—that of board plus 12 inches.
Depth, 27 inches.

DESIRABLE REQUIREMENTS FOR THE FARMHOUSE

RECOMMENDATIONS OF COMMITTEE ON FARM AND VILLAGE HOUSING,
PRESIDENT'S CONFERENCE ON HOME BUILDING AND HOME OWNERSHIP.

EXTERIOR OF THE FARMHOUSE

1

- A. General appearance—simple in line and detail rather than ostentatious.
- B. Shape, height, and architectural style of the house should be adapted to the site and general surroundings and to climatic conditions.
- C. Number, size, and location of doors and windows should afford pleasing appearance.
- D. Materials should be selected and used in accordance with purpose, economy, and local supply.
- E. The color scheme should be harmonious.

INTERIOR OF THE FARMHOUSE

2

- A. General arrangement.
 - 1. *Kitchen, food storage space and dining area* should be located with easy access to each other. The kitchen should have *view toward both farm buildings and highway*.
 - 2. Places for special work and for men to wash and to hang wraps should, if possible, be located near both the kitchen and a rear or side entrance.
 - 3. Living room should be located on sheltered side of house or where there is best view.
 - 4. It is desirable to have a bathroom with a toilet convenient to sleeping quarters.
 - 5. Main approach entrance for family and visitors alike should be easily reached from kitchen, but also should lead into living quarters.
 - 6. A passageway should lead from the main rear entrance to the living or dining room *without passing through kitchen work area*.
 - 7. Stairs should be located in the hall if there is one. Stairs to cellar should be convenient to kitchen and to rear entrance.
 - 8. The arrangement of doors and passages should accommodate social groupings.
 - 9. Doors, windows and passages should be arranged to provide ventilation.
 - 10. Covered porches should not be placed so as to reduce unduly the natural lighting of rooms.
- B. Facilities the farmhouse should provide.
 - 1. Living quarters.
 - (a) Space for comfort, rest, and reasonable privacy for all members of the family.
 - (b) Space for the placing of furniture to avoid interference with doors, windows and closets.
 - (c) Study equipment and play space for children.
 - (d) Facilities for correspondence, reading, keeping of farm records, and business transactions.
 - (e) Rooms arranged conveniently for visiting with friends and entertaining neighborhood gatherings.
 - (f) Provision for the young people to entertain their friends.
 - 2. Convenient working arrangements.
 - (a) Kitchen work centers grouped to save steps (stove, sink and work surfaces each not more than 12 feet from all others). Work space should be between 90 and 150 square feet in area, and should not be broken by doors and passages.
 - (b) Working heights that allow worker to stand or sit normally.
 - (c) Space for doing the laundry (see section A-2), and where washing machine, tubs, and other equipment may be left when not in use; should be protected from weather, close to drying space, and not less than 50 square feet in size.
 - (d) Space near rear entrance (general service room or porch—see section A-2) for preparing or canning products coming into the house. May be combined with laundry space.

3. Adequate storage facilities.

(a) For food.

- (1) Ample kitchen cupboards planned and located with reference to the material to be stored.
- (2) Refrigerator that maintains temperature below 50° for perishable foods in warm weather; size adapted to needs.
- (3) Ventilated cupboard or closet for cool weather and for year-around storage of the less perishable vegetables and fruits.
- (4) Storage for large quantities outside of kitchen work areas.
- (5) Cupboard and bins in dry basement near stairs or in other dry cool place for canned products and vegetables.

(b) For fuel.

- (1) Coal or wood storage convenient to heating plant.
- (2) Coal or wood box near range, the wood preferably put in from outside.
- (3) Kerosene or gasoline; small supply kept in convenient place, main supply kept outside of house.

(c) For operating equipment.

- (1) Work cabinet with satisfactory storage space for small and large utensils, kitchen tools and linens.
- (2) Separate closet space for cleaning equipment, off rear hall; minimum size 16 by 20 inches or equivalent.
- (3) Storage for ironing board near kitchen, or a built-in board.

(d) For wraps.

- (1) Front or side entrance wrap closet equipped with high and low hooks for adults and children; minimum size 36 inches wide by 20 inches deep.
- (2) Rear closet for rough wraps and work clothes, or hooks near rear entrance.

(e) For bedding and linen; minimum closet space 36 inches wide, 18 inches deep, height of room.

(f) For children's playthings; storage space under window seats, in closets or drawers, upon shelves or in boxes with lids.

4. Sleeping facilities.

- (a) At least one bedroom for every two adults.
- (b) Bedroom area, not less than 100 square feet for two persons.
- (c) A bedroom downstairs is desirable in houses of more than one story.
- (d) All bedrooms provided with cross ventilation and wall space for beds.
- (e) Closet or wardrobe space in addition to bedroom space, not less than 20 by 36 inches, height of room; should be equipped with shelf, rod for hangers, and shoe racks.

UTILITIES OF A. Lighting.

THE FARMHOUSE

3

1. Each room should have at least one unobstructed window; kitchen, living and bedrooms preferably should have windows on two or more sides.
2. *Direct sunlight* should enter at least three-fourths of the rooms.
3. There should be both daylight and artificial light on all work surfaces such as stove, sink, work and study tables, and at reading centers.

B. Heating.

1. Equipment should be capable of maintaining comfortable temperature, and of utilizing locally available fuels.
2. A properly designed and installed central plant is desirable in the colder regions.

C. Water supply and plumbing.

1. House should be provided first with piped water supply, sink, and drain. If piped water supply is not possible, a walk to well should be provided.
2. Hot water supply, bathroom (and septic tank), laundry, and washroom should be added as means permit.

PORTFOLIO

FARM AND VILLAGE HOUSING

333



Van Anda

HOUSE FOR A. U. HICKS, ROSLYN, LONG ISLAND

GODWIN, THOMPSON AND PATTERSON, ARCHITECTS

334

PORTFOLIO

THE ARCHITECTURAL RECORD



Van Anda

HOUSE FOR A. U. HICKS, ROSLYN, LONG ISLAND

GODWIN, THOMPSON AND PATTERSON, ARCHITECTS



Van Ande

HOUSE FOR J. VICTOR EAST, LONGMEADOW, MASS.

ARCHITECT UNKNOWN



Van Anda

HOUSE FOR J. VICTOR EAST
LONGMEADOW, MASS.

ARCHITECT UNKNOWN



Van Andu

HOUSE FOR S. K. BECKER, FAIRFIELD, CONN.

CAMERON CLARK, ARCHITECT

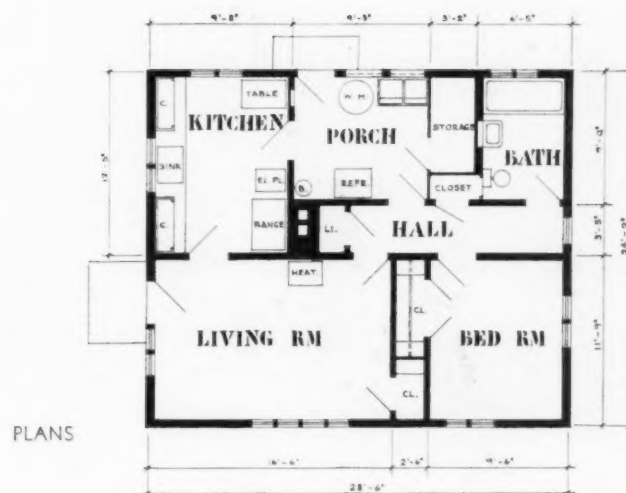
338

PORTFOLIO

THE ARCHITECTURAL RECORD



ELEVATIONS



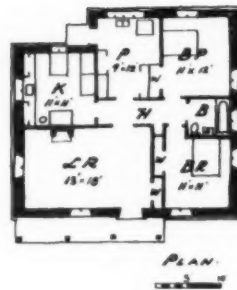
PLANS

FARMHOUSE

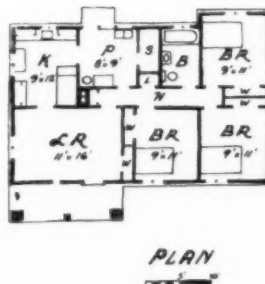
DEVELOPED BY DIVISION OF AGRICULTURAL ENGINEERING, UNIVERSITY OF CALIFORNIA,
FOR U. S. DEPARTMENT OF AGRICULTURE.

FOUR FARMHOUSES

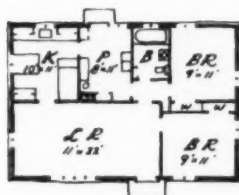
The one-story bungalow types permit light construction. These farmhouses suggest adobe or concrete but in reality most farmhouses in California are built of frame with stucco on lath. Cost for adobe would be somewhat higher than if stucco wall construction were used. All rooms have cross ventilation, particularly necessary in California. Living room, kitchen and two bedrooms.



A California type farmhouse with screened porch that also serves as laundry and workroom. The porch at center of side for coolness fulfills functions of hallway. There are three bedrooms, living room and kitchen.



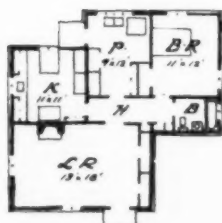
ESTIMATED COST
OF THESE HOUSES
IS \$2,250 AND \$2,900.



PLAN

A two-bedroom farmhouse that could have three bedrooms by reducing size of living room. See plan on opposite page.

Farmhouse faced with split redwood shingles or "shakes" intended for location in Northern California.



PLAN

Farmhouse intended for location in Southern California. The one-story house is well suited to informal additions.

A one-bedroom farmhouse that could be expanded to a two-bedroom type as with plan on opposite page.



ESTIMATED COST
OF THESE HOUSES
IS \$2,700 TO \$3,000.



T. V. A. HOUSE

N-2



Contains 12,900 cubic feet of space.

Extension to living room used for dining purposes. Dining table may be on screened porch.

The square-shaped kitchen is provided with a built-in cabinet, a refrigerator and storage space. The range and sink are placed beside a window, which insures a well lighted work space, as well as an outdoor view across the porch.

A narrow staircase leads to the attic, lighted and ventilated by gable windows.

Bedrooms are of large size with ample space for furniture.

There is space under the rear porch for use as a laundry and storage room.

Kitchen range, refrigerator and water heater are electrified.

Separation of house into two wings with an open space between, but all covered under same sweep of roof, insuring ventilation for homes built in warm climate. The open gallery area is convertible into a living room that can be inclosed when required.

There is thorough ventilation for every room. The bedroom and kitchen receive light and air from three sides. There is no basement, as storage space in attic and electric heating system make such space unnecessary.

Dining space is provided in kitchen.

Equipment includes electrified cooking range, hot-water heater and refrigerator.

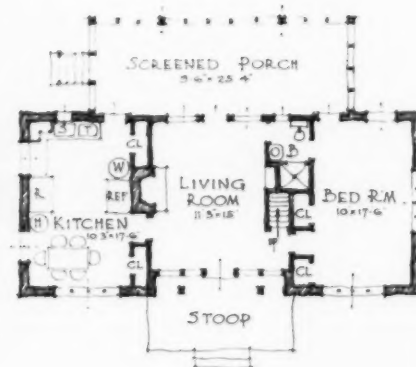
The screened porch is accessible to all rooms of house.

Walls are of brick.



T. V. A. "BREEZE-WAY"

HOUSE D-1



T. V. A. HOUSE
NORRIS, TENNESSEE

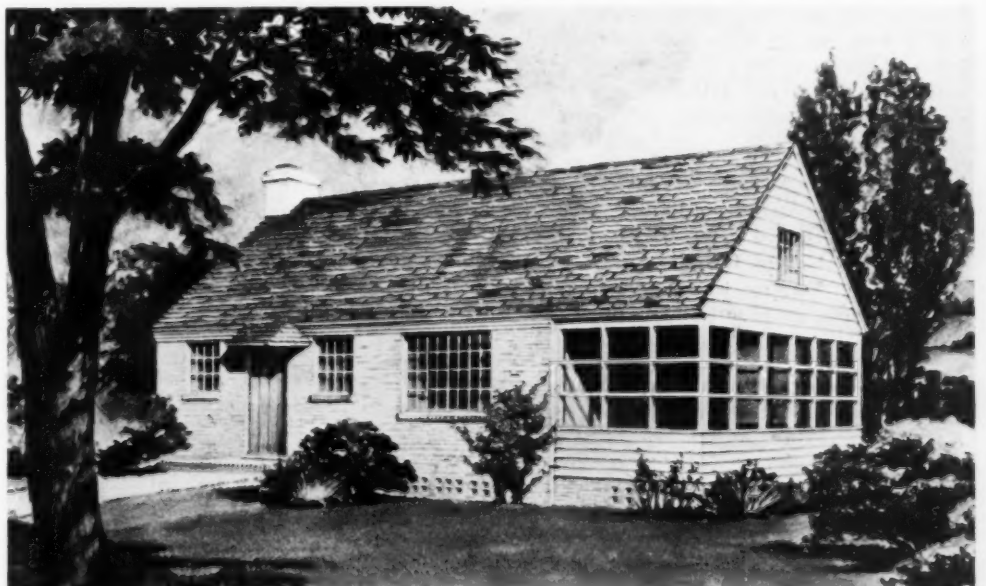
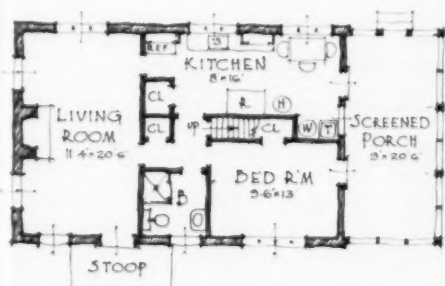


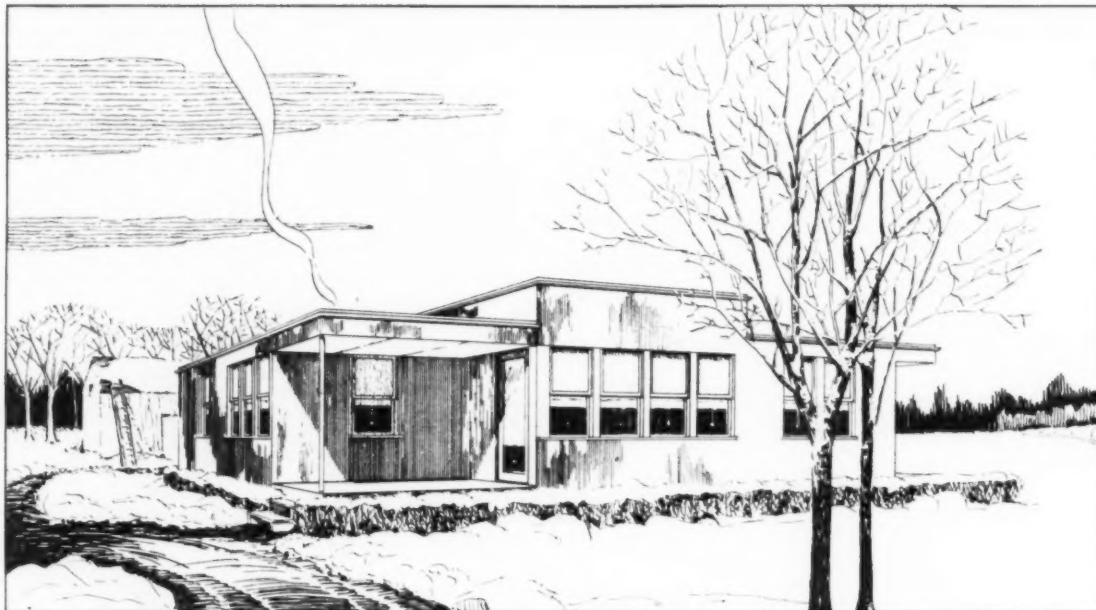
Four-room house with screened porch. Rooms are of ample size and well lighted. Undesirable arrangement of kitchen sink along line of traffic and without light, other than from distant window. Refrigerator at chimney and range at outer wall adjoining entrance door is impractical. It would be an advantage to enlarge bathroom. Walls of house are of wood, faced with shingles.

FOUR FARMHOUSES FROM THE TENNESSEE
VALLEY AUTHORITY AT NORRIS, TENNESSEE

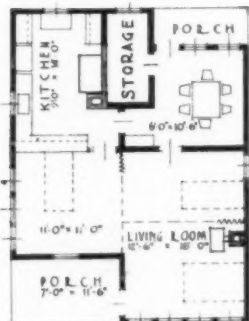
Three rooms of ample size. Kitchen arranged to care for dining purposes. Electric heaters in each room. There is no basement. Living room has windows on three sides insuring ample ventilation. Fireplace supplements electrical heating system. Central hall provides intercommunication between rooms including bathroom. Walls are of brickwork, stained white to match the woodwork or left natural in color.

T. V. A. HOUSE
NO. 32

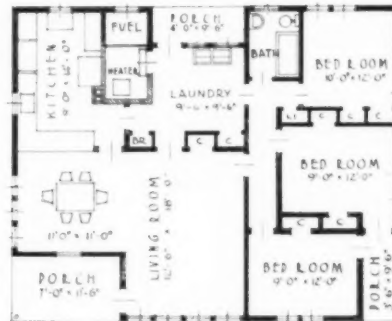




GENERAL
VIEW,
COMPLETE



PLAN,
FIRST STAGE



PLAN,
SECOND
STAGE

ONE-STORY EXPANSIBLE FARMHOUSE

DEVELOPED BY U. S. DEPARTMENT OF AGRICULTURE, BUREAU OF HOME ECONOMICS
AND BUREAU OF AGRICULTURAL ENGINEERING, CWA PROJECT.

First stage, 8,500 cu. feet. Front porch and living room face highway. Three bedrooms obtained by dividing living areas with curtains or folding partitions. Rear porch is entrance from barnyard. Wash or dining room giving access to kitchen, living room, heater or storage and fuel. Built-in closets for coats, wraps and brooms. Kitchen for cooking only, equipment arranged so as to eliminate unnecessary steps and avoid traffic through the working area. Views from kitchen to approach of house and to barnyard. All rooms have cross ventilation. Living room has a ceiling height of 9 feet 4 inches. All other rooms 7 feet 4 inches high for economy. Heating by circulator heater in living room or by central hot-water boiler with radiators. Simple rectangular shape of plan makes most economical construction possible and represents an architecturally finished appearance in this stage of development.

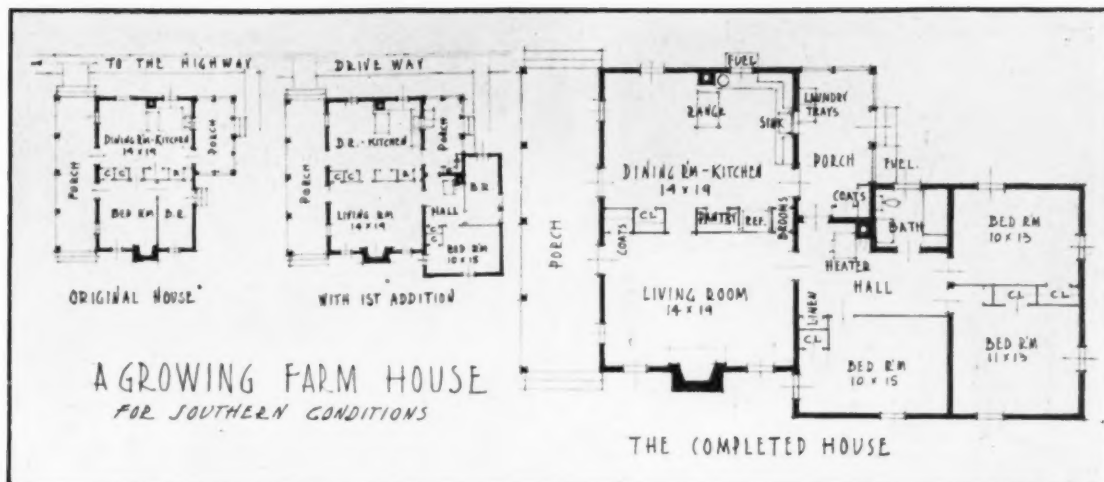
FIRST STAGE

Second stage, 14,000 cu. ft. Addition of 3 bedrooms, bath, and porch. Ceiling height 7 feet 4 inches. Built-in closets for clothes and linen provided in each room. Cross ventilation assured. Ample-sized living and dining rooms can be combined for gathering. All rooms are permanent and have direct access from either front or rear entrance. Bed and living rooms heated by hot-water system. Fireplace in living room obtainable. Erection of addition does not involve major changes in structure of first stage and expanded house shows the complete dwelling as an integral whole.

SECOND STAGE

Construction methods. The plan and design can be adapted to brick, concrete, or other masonry construction, to wood frame and to systems using fabricated wall, window and door units 3 feet 6 inches wide. Frame construction with suitable coverings is one low-cost method easily erected and adaptable to most parts of the country. Dry materials which can be readily placed and are not subject to cracking are preferable. Exterior wall coverings may be boards and battens, sheet metal or sheathing covered with painted canvas. Interior wall coverings may be of narrow boards with v-joints, plywood or fiber board. Insulation against heat or cold should be provided in walls and ceiling. Flat roofs covered with built-up roofing are used because they eliminate special roof framing.

CONSTRUCTION METHODS



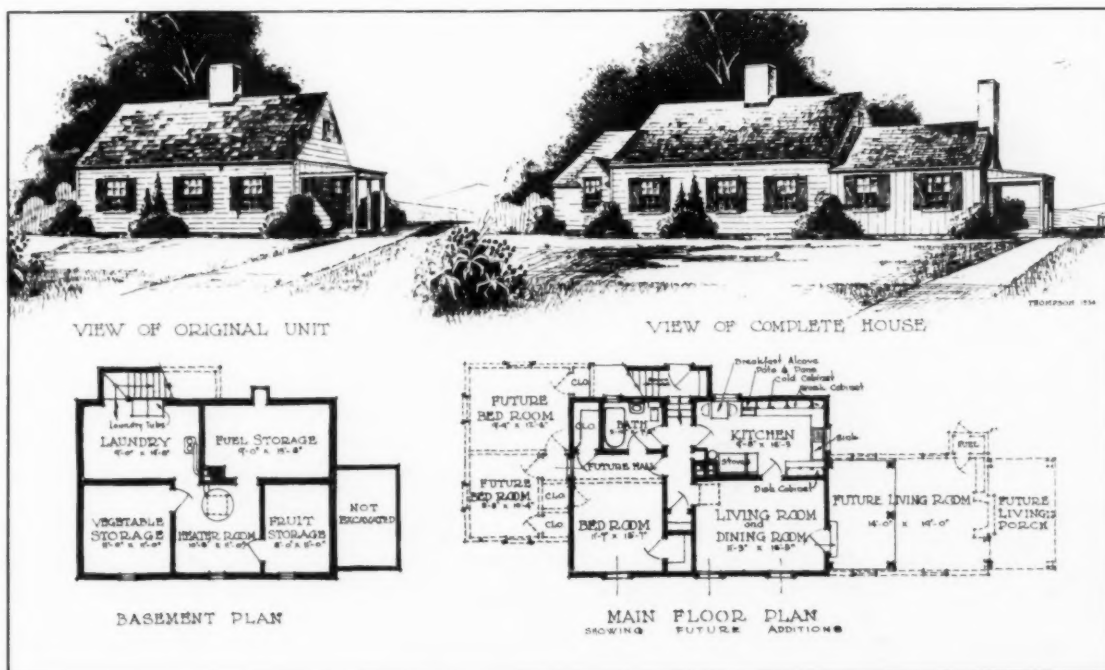
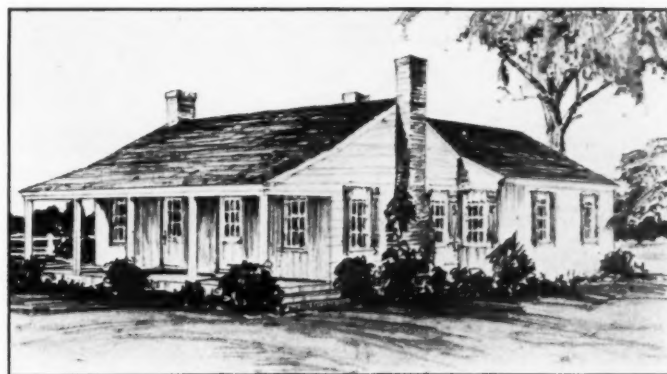
SOUTHERN FARMHOUSE

DEVELOPED BY U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF HOME ECONOMICS AND BUREAU OF
AGRICULTURAL ENGINEERING, CWA PROJECT.

The original unit provides two temporary bedrooms. Entrances are located to give convenient access to kitchen and living room from front or rear. Kitchen is so arranged that persons going from one part of house to another, or passing in or out of house will not interfere with the kitchen work. Work area provides for convenient arrangement of equipment. Plenty of storage space is provided for foods, clothing and the current supply of fuel. Men coming from barns or fields can leave outdoor clothing on back porch before entering house.

Entire house, in mild climate, can be heated by circulator heater in central hall.

All rooms have cross ventilation.



ONE STORY EXPANSIBLE FARMHOUSE.

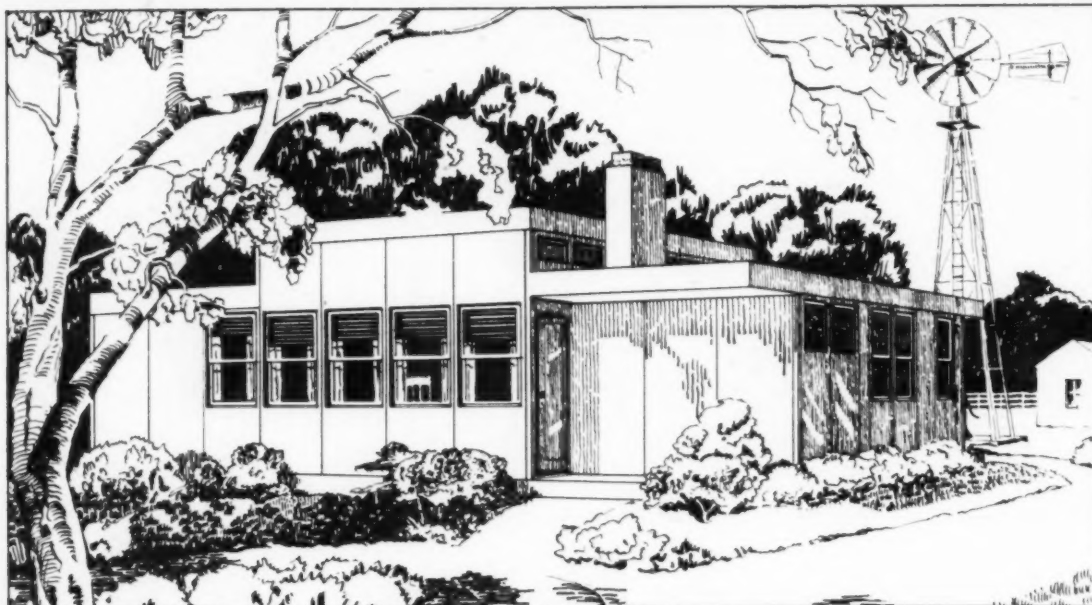
DESIGNED BY VIRGINIA
POLYTECHNIC INSTITUTE, BLACKSBURG, VIRGINIA, IN
COOPERATION WITH THE U. S. DEPARTMENT OF
AGRICULTURE, CWA PROJECT.

First unit consists of combined living-dining room, front porch, kitchen, bedroom and bath. Basement with laundry, heater room, fuel-, vegetable- and fruit-storage. All rooms can directly be reached by the central hall. The windows are arranged for cross ventilation and desirable outlooks. Heat by hot air furnace.

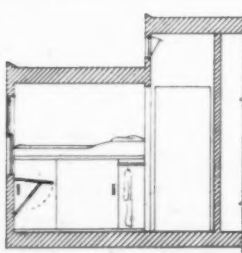
Addition of two bedrooms. Future hall provides convenient relation of bedrooms and bath. Plenty of closets for clothing and linen.

Addition of larger living room. Former living-dining room becomes dining room only.

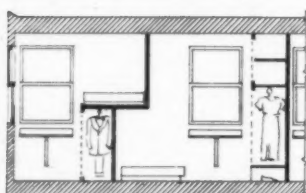
Additions can be erected without inconvenience for housekeeping in original house and structural changes therein.



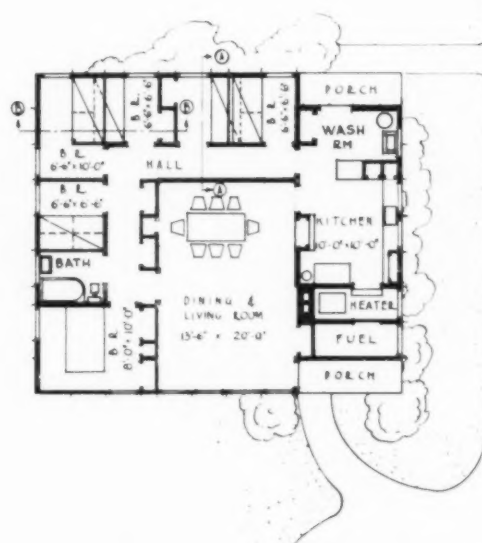
PERSPECTIVE



SECTION A-A



SECTION B-B



PLAN

FARMHOUSE PROPOSED FOR LOWER INCOME GROUP

DEVELOPED BY U. S. DEPARTMENT OF AGRICULTURE, BUREAU OF HOME ECONOMICS AND BUREAU OF AGRICULTURAL ENGINEERING. C.W.A. PROJECT.

This farmhouse with utmost economy in space is intended for the lower income group and for families up to 5 children.

The combined dining-and-living room being used by all members of the family and simultaneously for the largest amount of time has naturally the greatest floor area and ceiling height.

The bedrooms are limited in size to the space required for the bed and for dressing. Beds are arranged in the manner of double bunks but being accessible from different sides a separate bedroom is provided for every child with no more area needed than for rooms with 2 beds.

Built-in clothes closets and shelves eliminate the usual furniture. A drop-leaf desk under the window makes the room usable for undisturbed studying. The house is entered from the highway by a sheltered entrance to the living room and from the farmyard side by a rear porch leading into the washroom, kitchen and hall. Kitchen and washroom are combined for convenience of working and for economy of plumbing.

The house design is suitable for masonry, concrete, frame and prefabricated construction systems.

The plan is based on units of 3'-6" and half units. With ordinary materials this feature simplifies erection and makes possible the use of similar types of doors, windows, etc. With prefabricated methods panels of the width of one or one-half units and heights from floor to ceiling are produced.

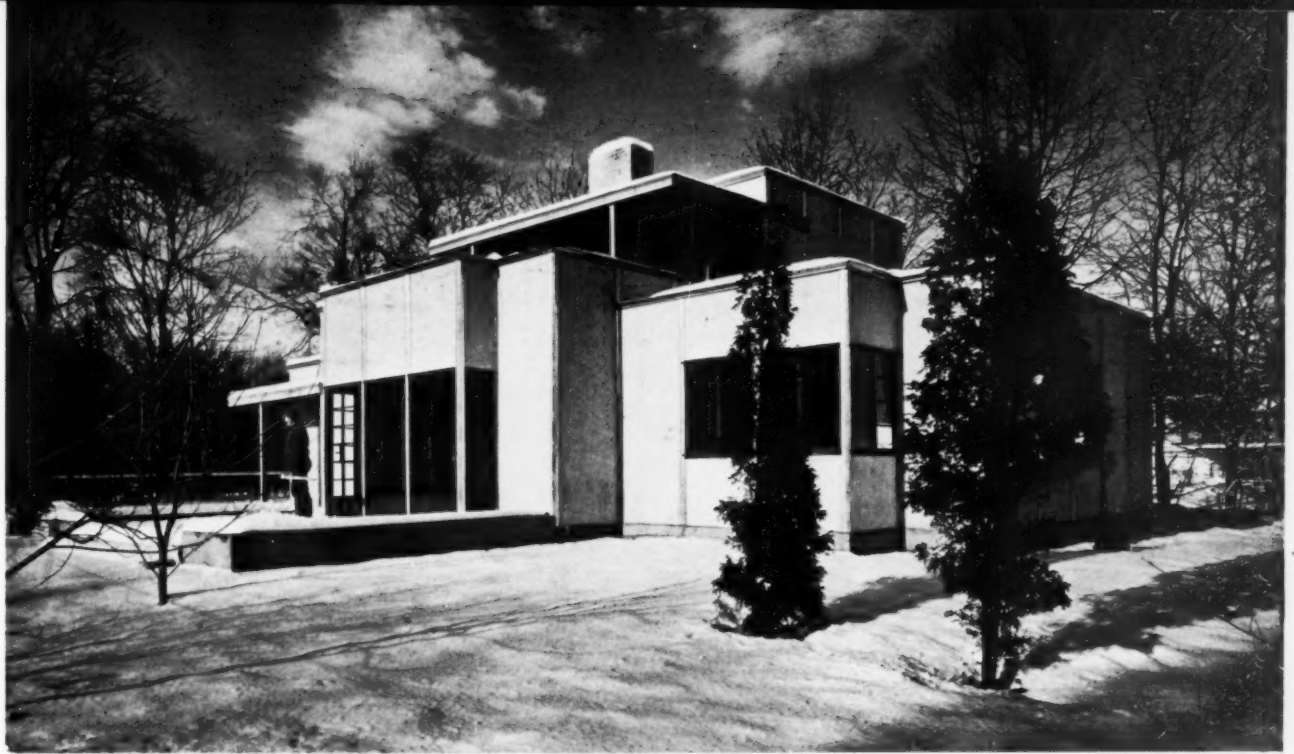
Closets, cabinets and partitions are based on the same module and consist of completely finished sections built of wood, steel or other suitable material. Prefabricated lightweight systems are especially adaptable to regions without local building materials and skilled labor because of small transportation cost and ease of erection of ready-made parts.

PURPOSE

REQUIREMENTS

CONSTRUCTION

GENERAL
VIEW



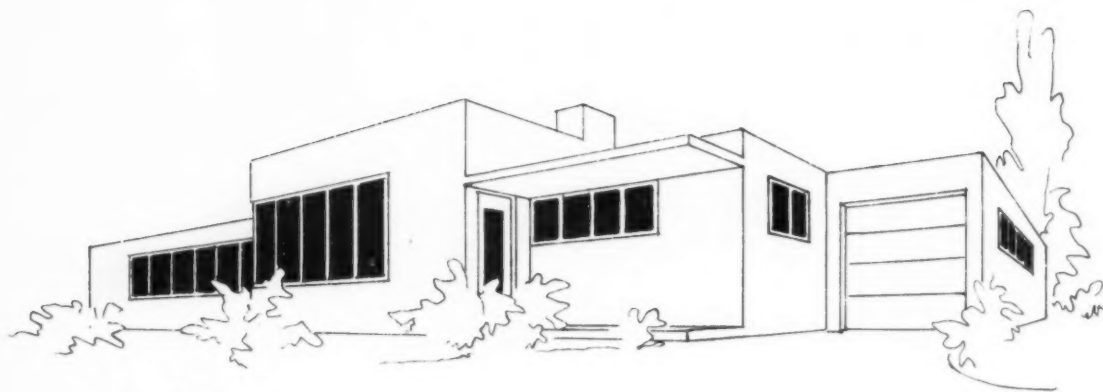
DETAIL OF
DECK
PORCH



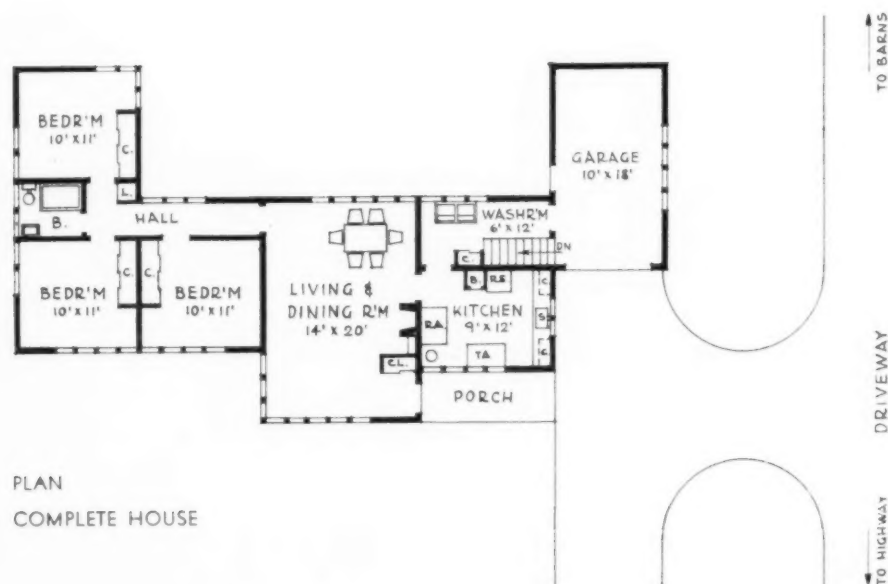
Photos, F. S. Lincoln

HOUSE ON LONG ISLAND. HOLDEN AND McLAUGHLIN, ARCHITECTS, (American Houses, Inc.)

The informality of this type of house is suitable to country location. It is apparent that the unit system permits expansion, a common necessity of farmhouses. It provides good insulation, fireproofness, low maintenance cost, low insurance rate and eliminates waste space because of flat roof. The roof porch is used for sitting and sleeping.



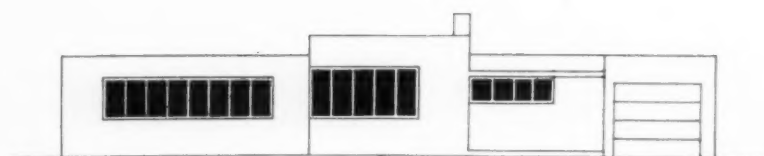
PERSPECTIVE



PLAN
COMPLETE HOUSE



PLAN,
FIRST STAGE



FRONT ELEVATION

FARMHOUSE

DEVELOPED BY DIVISION OF AGRICULTURAL ENGINEERING, MICHIGAN STATE COLLEGE, FOR UNITED STATES DEPARTMENT OF AGRICULTURE, CWA PROJECT

SUBSISTENCE FARMSTEADS

BY

A. LAWRENCE KOCHER AND

ALBERT FREY

The subsistence farmstead is intended primarily for city workers who have taken up land as a place to build a house and where some foodstuffs may be provided by the cultivation of a garden and the keeping of chickens. It is not intended to compete with the more productive purposes of a farm. It is not expected to provide complete subsistence. It can aid one who works in the city with a low wage.

The subsistence *farmhouse* must provide many of those comforts and conveniences to which the city dweller is accustomed. It can be as compact as an apartment but with an arrangement that will facilitate light farm work.

CHECKING LIST OF REQUIREMENTS

WITH AMPLE LAND, IT IS MOST ECONOMICAL TO HAVE ALL ROOMS ON ONE FLOOR (ELIMINATING STAIRWAY AND HALLS—ROOF LIGHTER IN CONSTRUCTION THAN FOR A SECOND STORY).

ROOMS DIMENSIONED TO EXACT NEEDS.

BEDROOMS, USED ONLY AT NIGHT, ARE OF SMALLEST SIZE.

LIVING - DINING ROOM OF MOST GENERAL USE IS OF AMPLE SIZE.

KITCHEN, FOOD STORGE ROOM AND LAUNDRY AS SUITE AND WITH CONSIDERATION OF FARMING REQUIREMENTS.

WINDOWS OF KITCHEN OVERLOOK FARMSTEAD.

CROSS VENTILATION.

COMBINATION OF KITCHEN - DINING AREAS.

CONVENIENCES OF WASHROOM FOR FARMER ENTERING HOUSE.

PLUMBING GROUPED.

ENTIRE FLOOR AREA UTILIZED. NO HALLWAYS OR VESTIBULES.

BUILT-IN CLOSETS OF STANDARD SIZE.

FEWEST POSSIBLE DOORS.



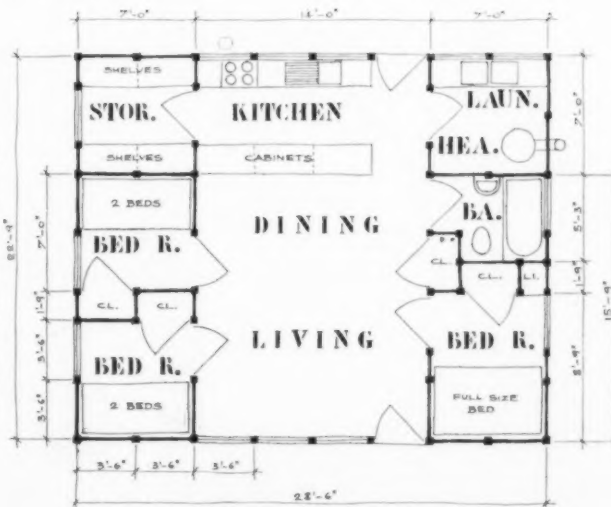
SUBSISTENCE FARMSTEAD PLAN

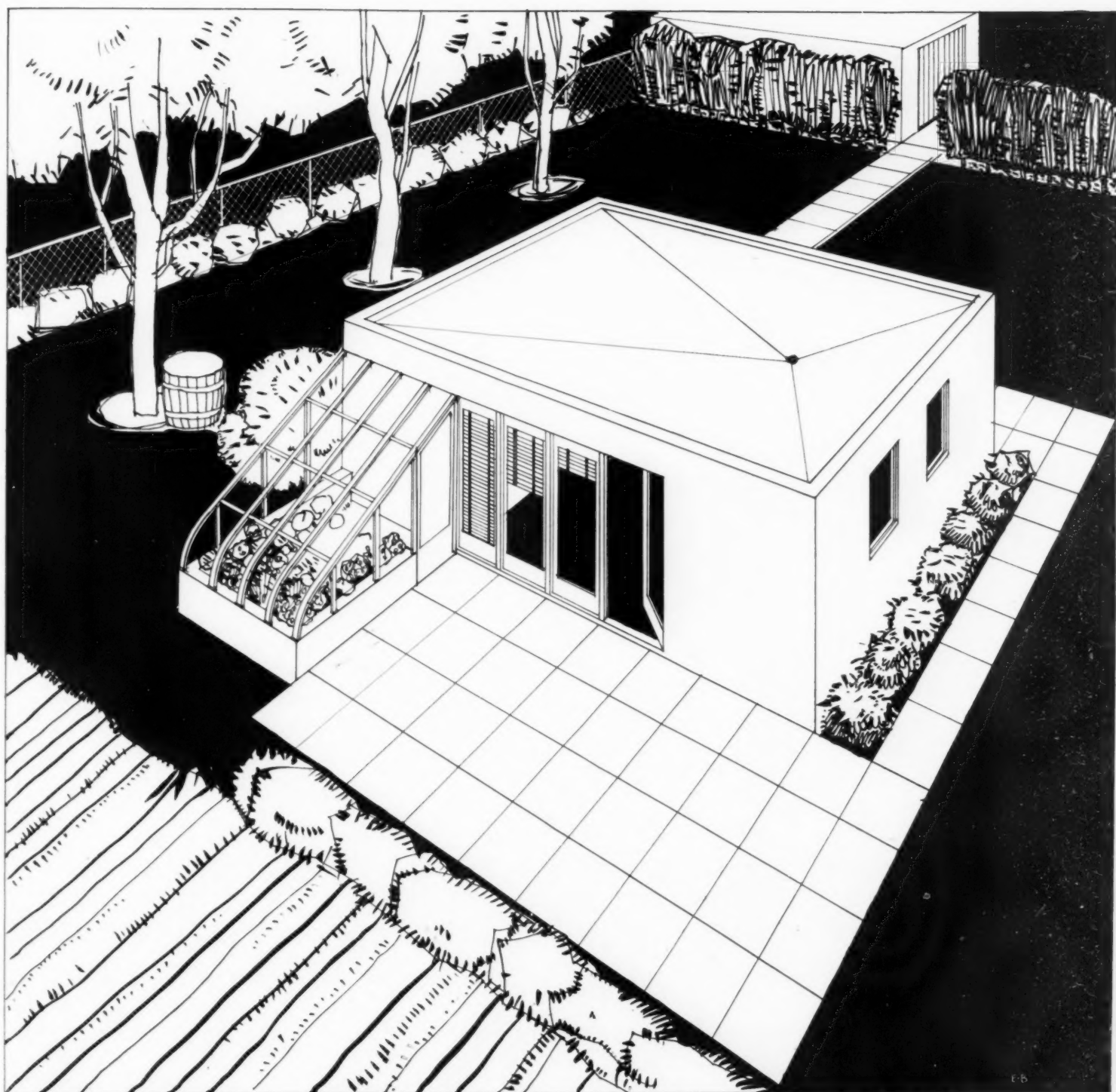
for location along existing highway. Houses are located near to road in order to reduce cost of driveways and water supply. Each plot is approximately one acre in size. Additional fields at rear of subdivision are available for cultivation as required.

The site selected has electricity ready for extension. Each house is provided with a septic tank for sewage disposal.

PROPOSED FARMHOUSE PLAN FOR SUBSISTENCE DWELLERS

The house is small in size because intended for unemployed with very limited funds. At the same time maximum accommodation and convenience are required. The large living-dining room is combined with kitchen so as to obtain a spacious interior having cross ventilation and good lighting. The kitchen also relates to a storage room for storage of fruits, vegetables and canned goods. A laundry room is at right side of plan. A hot water heater is placed in the laundry. Bedrooms at left are of small size with double-decker beds. A larger bedroom for parents is at right of plan and with space for a double bed. Closets are steel and extend from floor to ceiling. Precast concrete panels are used for construction. These are 3'6" units or half units. This precast system is suited to CWA labor with skilled supervision.

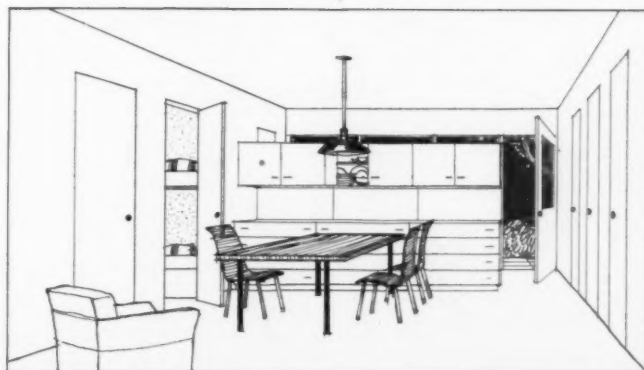




PERSPECTIVE VIEW OF SUBSISTENCE FARMHOUSE

Walls constructed of cinder concrete blocks or poured concrete. Roof of precast concrete beams and panels. Suited to use of local materials and production of blocks or units by owner. Fireproof and low-cost.

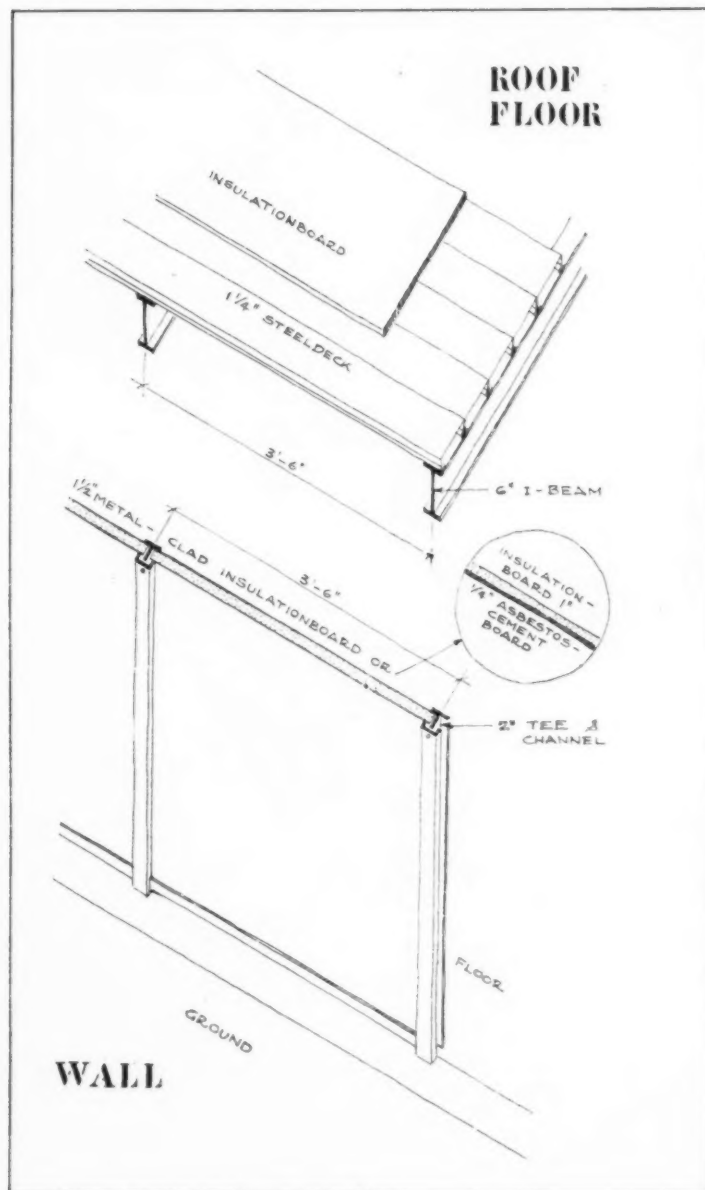
Interior of living-dining room, showing cabinets separating kitchen from living-dining space. All other rooms are directly accessible.



PREFABRICATED SYSTEM

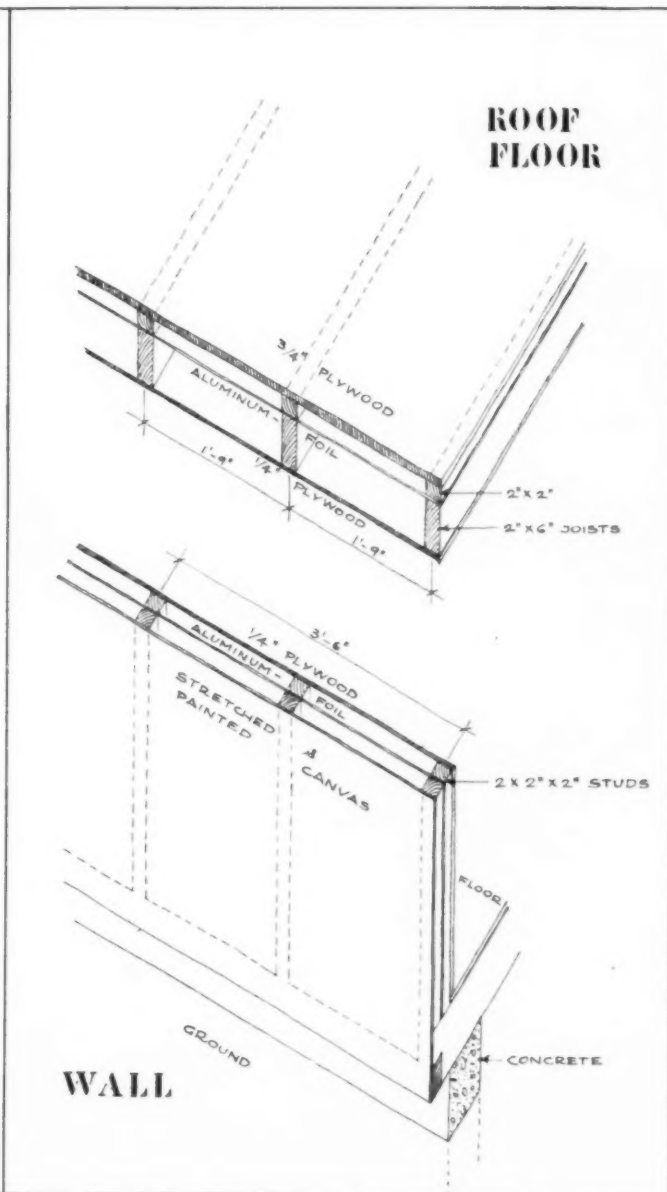
(Fireproof)

Use is made of standard and available steel parts such as steel angles, channels, girders, floor deck and steel faced insulation board. This construction is cheap with quantity production. It is moderate in cost for 25 houses.



WOOD AND CANVAS

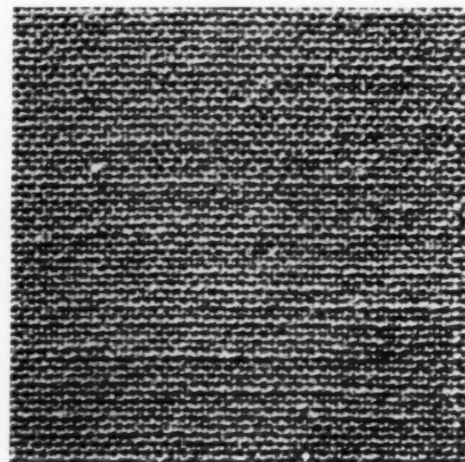
This construction method is cheapest of all. It has high insulation value and is very well suited to enlargement.



STRUCTURAL SYSTEMS ADAPT-
ABLE FOR SUBSISTENCE
FARMHOUSE CONSTRUCTION

KOCHER AND FREY
NEW YORK

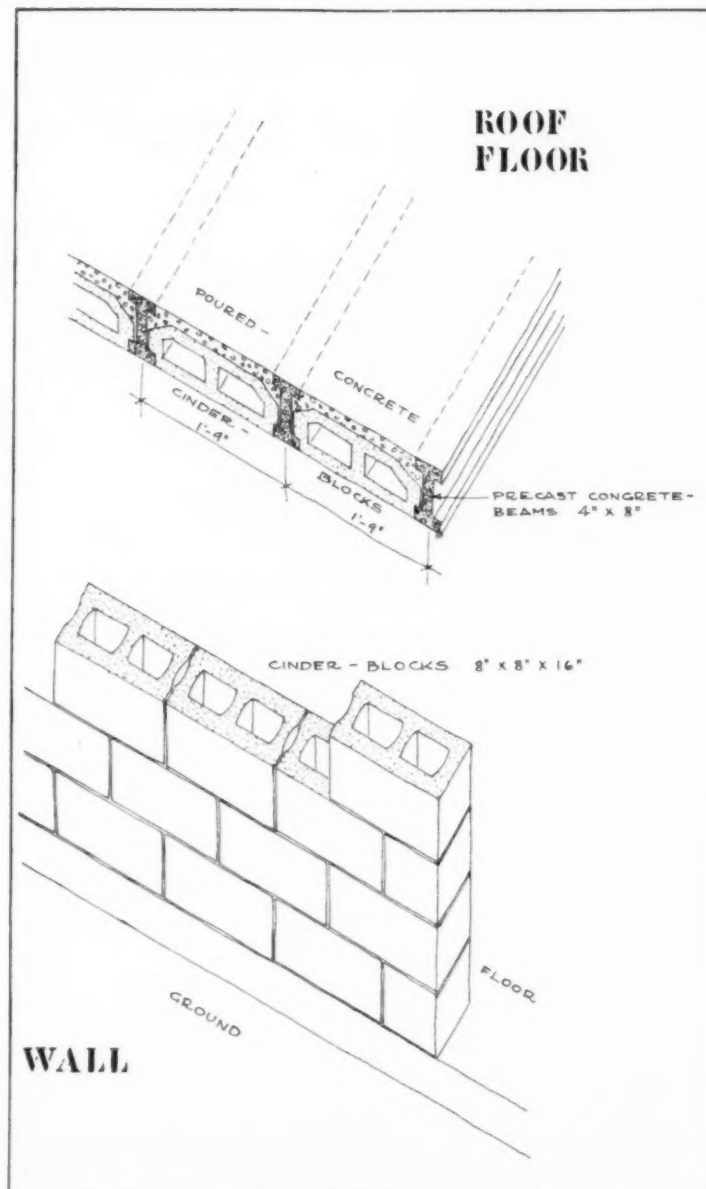
CANVAS
BEFORE
PAINTING



CINDER OR OTHER CONCRETE BLOCKS

(Fireproof)

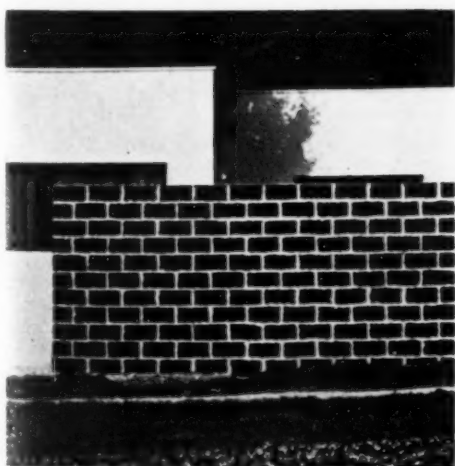
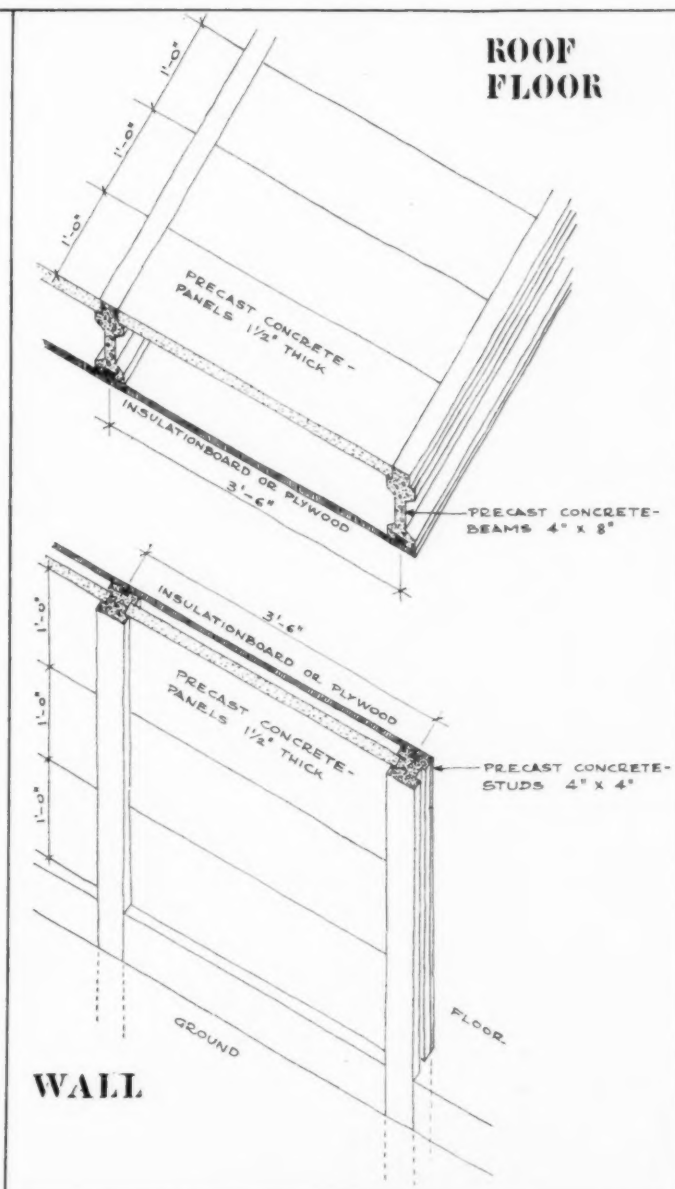
This method is economical if blocks are cast in the field where building operation is carried on. This is especially so when sand or cinders are obtained locally.



PRECAST CONCRETE (Post and Plank)

(Fireproof and termite-proof. Low maintenance)

It is not difficult for unskilled labor to erect the parts of this house. There would be supervision in the making of precast units of uniform size and in erection of posts and girders. A very economical system.



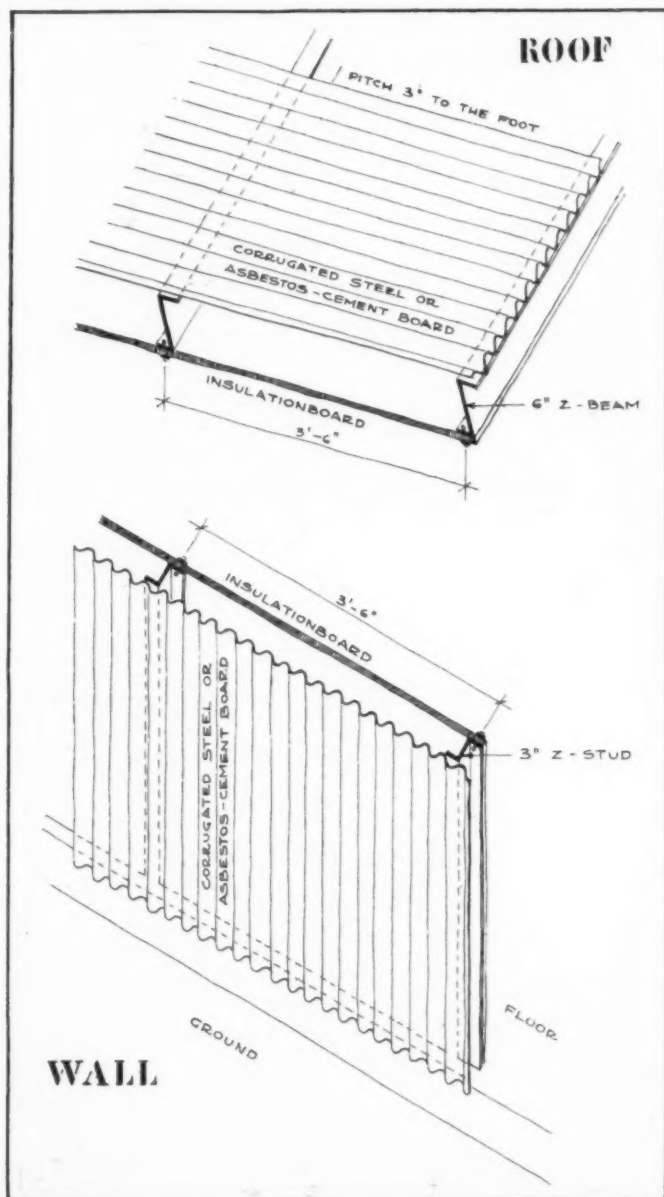
CINDER BLOCKS
WITH AND WITHOUT
STUCCO COAT



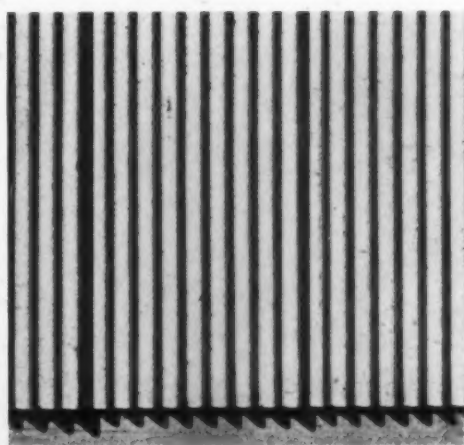
TYPICAL CAST
CONCRETE
SURFACE

LIGHT STEEL MEMBERS

Connections by bolting and clips. Facing with light sheet steel or corrugated asbestos board. Inside walls faced with asbestos board. Ease of construction and reerection. High salvage value. Fireproof. Lightweight.



ACTUAL APPEARANCE OF CORRUGATED STEEL OR ASBESTOS-CEMENT BOARD



STATUS OF SUBSISTENCE HOMESTEAD PROJECTS

(Figures in parentheses for each project show approximate cash allocation and number of homesteads. Published by courtesy of U. S. Government, Subsistence Homesteads Division.)

Birmingham, Ala. (\$750,000; 300)—Land acquired; plans well advanced; land improvement under way.

North Georgia Project (Jones & Putnam Counties)—(\$1,000,000; 500)—Acquiring land and doing survey work.

Pender County, N. C. (\$1,000,000; 500)—Land acquired; land improvement under way.

Decatur, Ind. (\$145,000; 48)—Land acquired; land improvement under way; about to start construction.

Westmoreland County, Pa. (stranded coal miners)—\$200,000; 100)—Land acquired; land improvement under way; house plans nearly completed.

Tygart Valley (near Elkins) W. Va. (\$250,000; 125)—Land being acquired; land improvement starting.

Monmouth County, N. J. (decentralization of industry involving Jewish needle workers)—(\$500,000; 200)—Land being acquired; plans almost complete.

Youngstown, Ohio. (\$500,000; 160)—Land being acquired; organization set up.

Dayton, Ohio. (\$359,000; 200)—Some houses complete in one unit; project being extended to four new units.

Reedsville, W. Va. (experimental village)—(\$500,000; 125)—50 houses nearly finished and rest ready to begin.

Austin, Minn. (\$125,000; 50)—Land acquired; land improvement under way.

Wilmington, Del. (\$200,000; 70)—Land being acquired; improvement and plans under way.

Crossville, Tenn. (\$471,500; 250)—Land acquired; improvement under way; plans nearly complete.

Arlington, Tex. (\$125,000; 50)—Land acquired; land improvement under way; plans nearly complete.

Wichita Falls, Tex. (\$125,000; 50)—Land acquired; land improvement under way; plans nearly complete.

Three Rivers, Tex. (\$125,000; 50)—Land acquired; land improvement under way; plans nearly complete.

Arlington, Tex. (\$250,000; 100)—Land acquired; land improvement under way; plans nearly complete.

Houston, Tex. (\$250,000; 100)—Land acquired; land improvement under way; plans nearly complete.

Wisconsin Forest Farms (Northern Wis.)—(\$450,000; 400)—Land acquisition beginning; surveys under way.

McComb, Miss. (\$62,500; 25)—Land acquired; improvement under way; planning nearly done.

Laurel, Miss. (\$62,500; 25)—Land acquired; improvement under way; planning nearly done.

Tupelo, Miss. (\$62,500; 25)—Land acquired; improvement under way; planning nearly done.

Meridian, Miss. (\$62,500; 25)—Land acquired; improvement under way; planning nearly done.

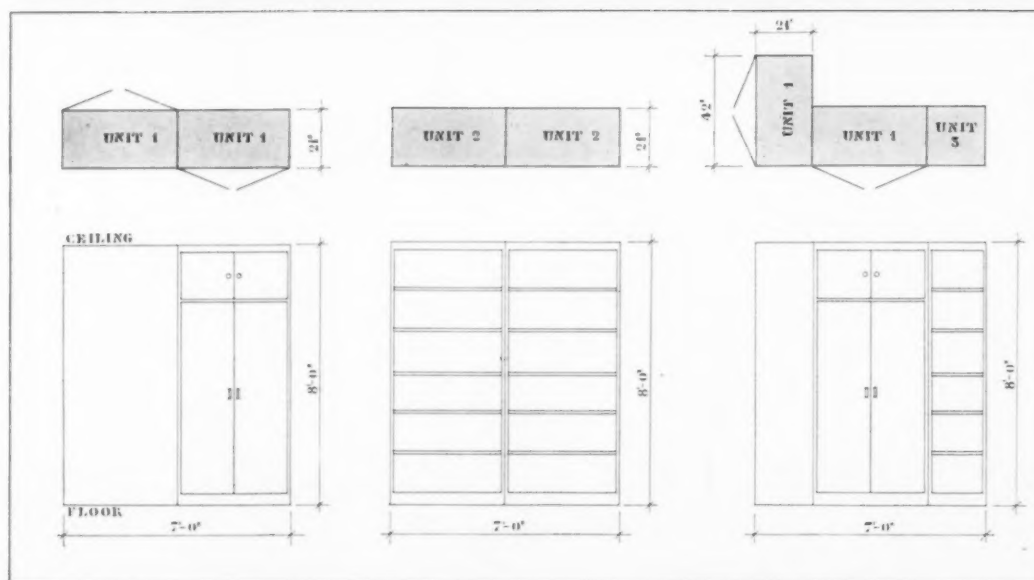
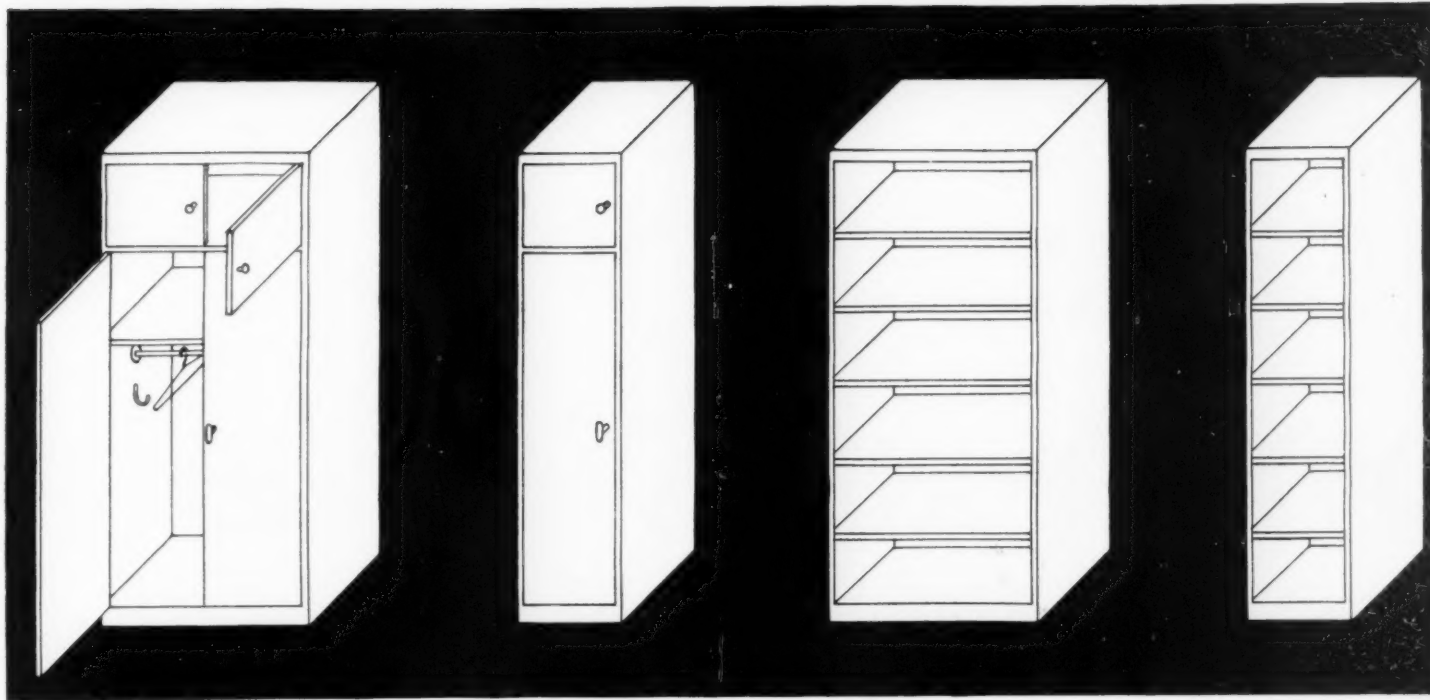
Hattiesburg, Miss. (\$62,500; 25)—Land acquired; improvement under way; planning nearly done.

Rochester, N. Y. (\$100,000; 33)—Land being acquired and other plans being prepared.

Jasper, Ala. (\$244,000; 100)—Land being acquired.

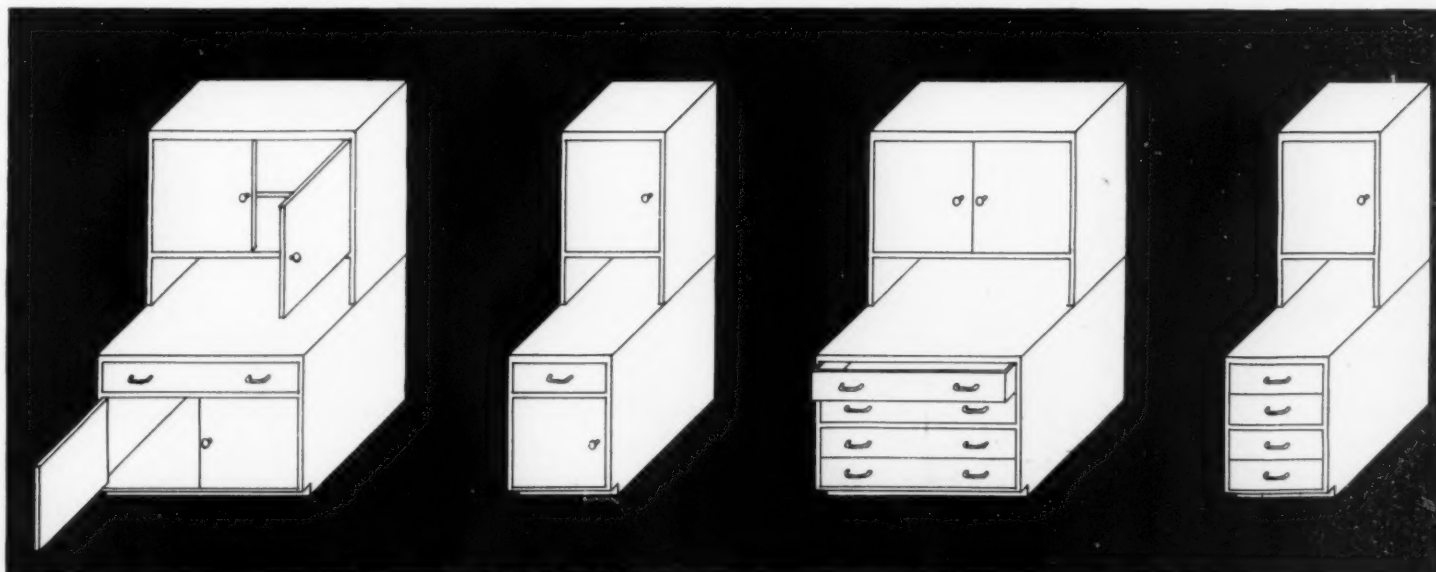
A two-unit project in Los Angeles, Calif., is to be announced.

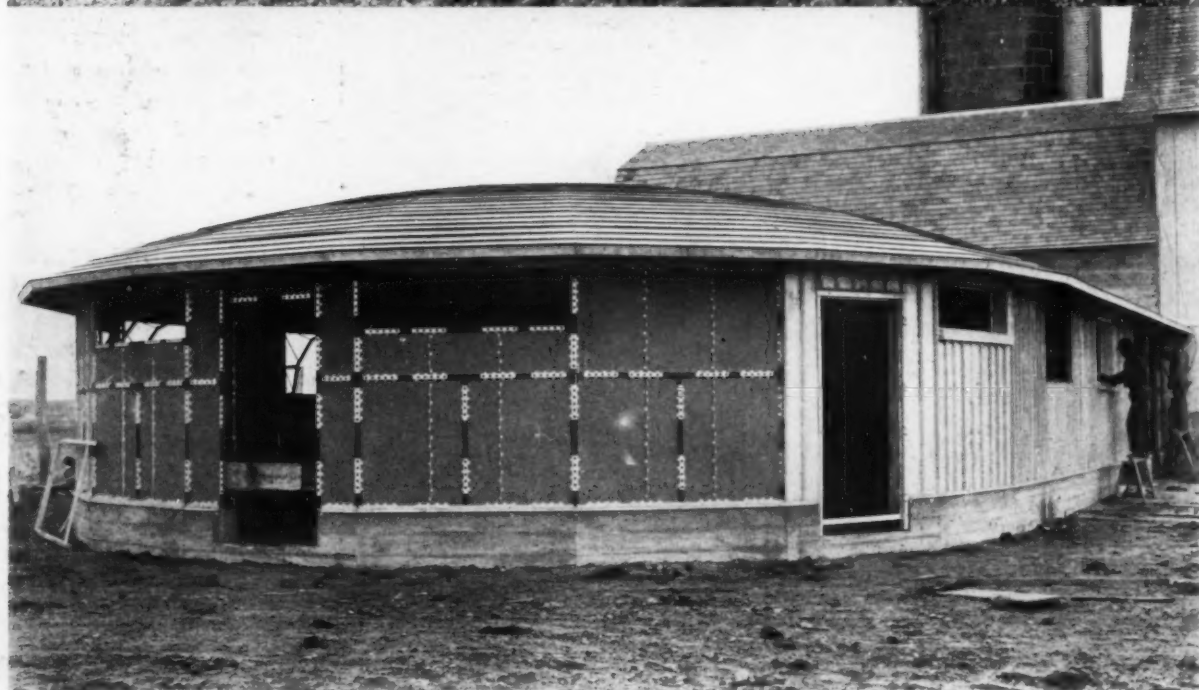
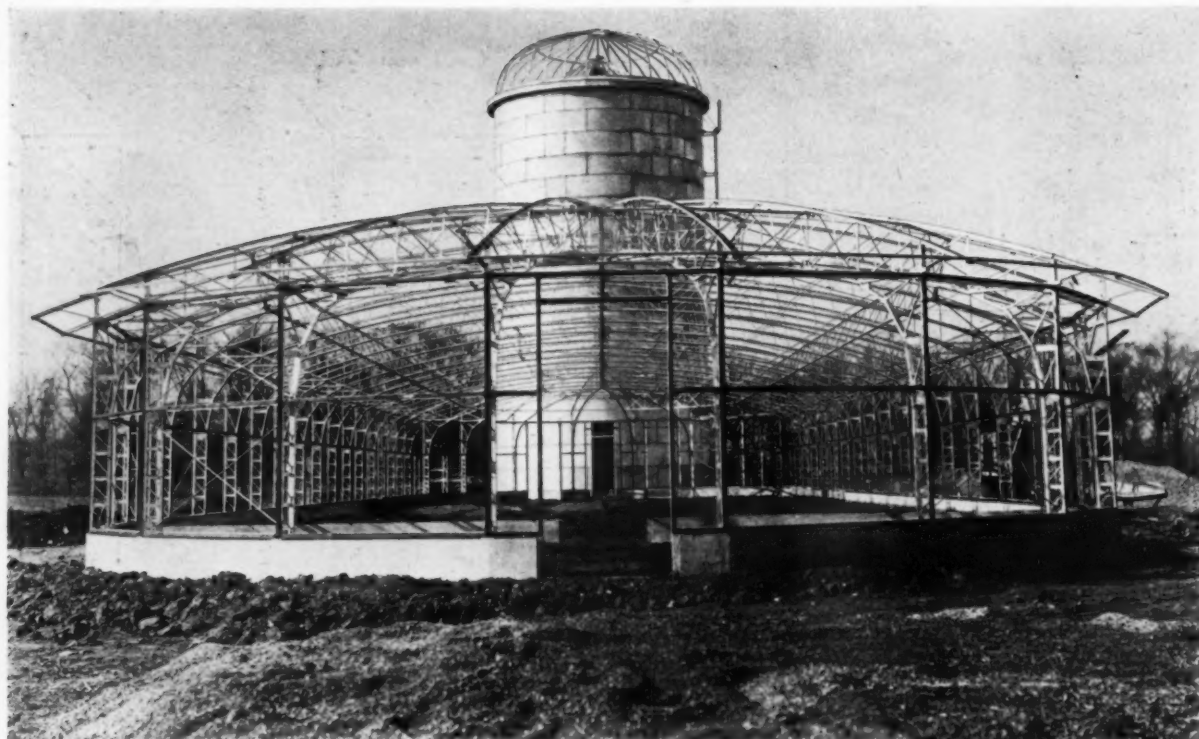
Usually the planning and acquisition stage is longer than the actual construction on the above projects.



CLOSETS and CABINETS

for the subsistence farmhouse were designed so as to care for the usual storage for a farm. They are made of steel and in quantities of 200 are more economical than of wood construction. Closets extend from floor to ceiling. Cabinets are 56" high. See plan on page 350 for location of these steel units. These cabinets were detailed by Hamilton Manufacturing Company for A. Lawrence Kocher and Albert Frey; Arthur Barzaghi, consulting engineer.





Iron Age

A FIREPROOF AND SANITARY BARN

36 feet by 126 feet, and a

CROP KEEPER

24 feet 8 inches by 45 feet, framed with light stamped steel sections.
Walls and roof are insulated and covered with metal sheathing.

TECHNICAL NEWS
AND
R E S E A R C H

BY

P. BURKE JACOBS

HEAT AND LIGHT ON THE FARM



Nesmith

CERTAIN FARM WASTES WHICH ARE TO BE FOUND PRACTICALLY EVERYWHERE WILL PRODUCE LIGHT, HEAT OR GAS UNDER VARIOUS CONDITIONS. THE GENERAL PROBLEM OF UTILIZING THESE FARM WASTES IS ONE OF GREAT NATIONAL ECONOMIC IMPORTANCE, INASMUCH AS A FINANCIAL RETURN FROM THESE WASTES EITHER DIRECTLY OR INDIRECTLY WOULD INCREASE THE FARM INCOME.

HEAT AND LIGHT ON THE FARM

THE UTILIZATION OF FARM WASTES

By **P. BURKE JACOBS**

CHIEF, AGRICULTURAL BY-PRODUCTS LABORATORY,
BUREAU OF CHEMISTRY AND SOILS, UNITED STATES
DEPARTMENT OF AGRICULTURE, AMES, IOWA

THE problem of power, heat and light for the farm home involves many factors. The construction of the house, its requirements, the number of occupants, the situation of the farm with respect to nearness to a large community or to commercial sources of supply of fuel or power, and the number and kind of farming operations normally carried on, all must be considered before specific decision can be made as to the type and size of service units to be installed. Any article on this subject must therefore be somewhat general in character.

POWER SOURCES

The selection of power generation equipment for the farm is primarily a question of geographical location and size of desired units. In the eastern states a large percentage of farm homes are located near thriving communities, and usually electric power lines are available, due to density of population, except in the more sparsely settled areas. Where such power lines are not available, adequate generating units, driven by gasoline engines and operating in connection with storage batteries, are commercially obtainable which are perfectly capable of meeting the usual

demands of isolated properties. It is not believed at present that any better or more economical system of power generation, by the use of local wastes, can be evolved. Such units should be located with respect to convenience, noise of operation, protection from freezing or other weather conditions, and accessibility.

When the question of available gas, suitable for heating and lighting, is considered, the problem becomes more difficult. Installation of a large gas distribution system involves a heavy expense. Obviously, the cost of gas, or electric power, to a consumer must be based on the cost of supply lines and the number of consumers on these lines. Therefore a gas distribution system to a farm region is usually impractical unless the farms are closely located to a municipal distribution system. In areas adjoining large cities, or in thickly settled districts where large towns are close together, as is the case in the eastern states, gas may be secured at reasonable cost. In other parts of the country farmers are fortunate in having supplies of natural gas available, as in West Virginia and western Pennsylvania, or Texas and Oklahoma, for example. At some points deposits of marsh gas are available. In certain areas some attempt has been made to commercialize the sale of compressed illuminating gas, whereby fresh cylinders of gas are delivered by the gas company and attached to the house distribution system. But generally speaking, gas is comparatively unobtainable on the farm, recourse being had to kerosene as a substitute, but the usual farm home depends on wood or cobs as a direct fuel.

In many areas farmers are located reasonably close to supplies of coal, in which case the farm heating equipment will likely be based on the use of such fuel. In many parts of the country, however, the sources of fuel other than wood are quite remote, and it is to these areas especially that the idea of generation of fuel gas from waste becomes attractive. Some districts in the south depend on stump pine wood or pine charcoal for fuel, coal being considerably more expensive. Other districts, like North Dakota, use peat or lignite deposits for fuel where available. In general, the fuel question becomes especially serious through the more thinly settled western states where coal is remote and where large cities do not exist, and it is these general districts that the government has chiefly in mind in the experimentation which is being conducted in the hope of finding some adequate design or process to meet the problem.

HEAT AND LIGHT SOURCES



Hoit-Nesmith

SUCH MATERIALS AS CORNCOBS, CORN-STALKS, OAT HULLS, RICE HULLS, WHEAT STRAW, NUTSHELLS, TOBACCO STEMS, AND THE LIKE ARE ANNUALLY OBTAINABLE, AND WASTED IN ENORMOUS QUANTITIES. . . .

Considerable interest is being displayed by the public in the possibility of heating and lighting the farm by means of its own waste products, and there seems to be considerable misapprehension of the fundamental economics involved. Quite obviously such generation of heat or gas from wastes involves expense for installing the necessary equipment, and also involves a certain amount of labor, care and attention. The possibility that the raw materials required for generating gas might have value for other purposes is a factor of the problem, and in addition there are certain fundamental facts and hazards to be considered.

POWER FROM FARM WASTES

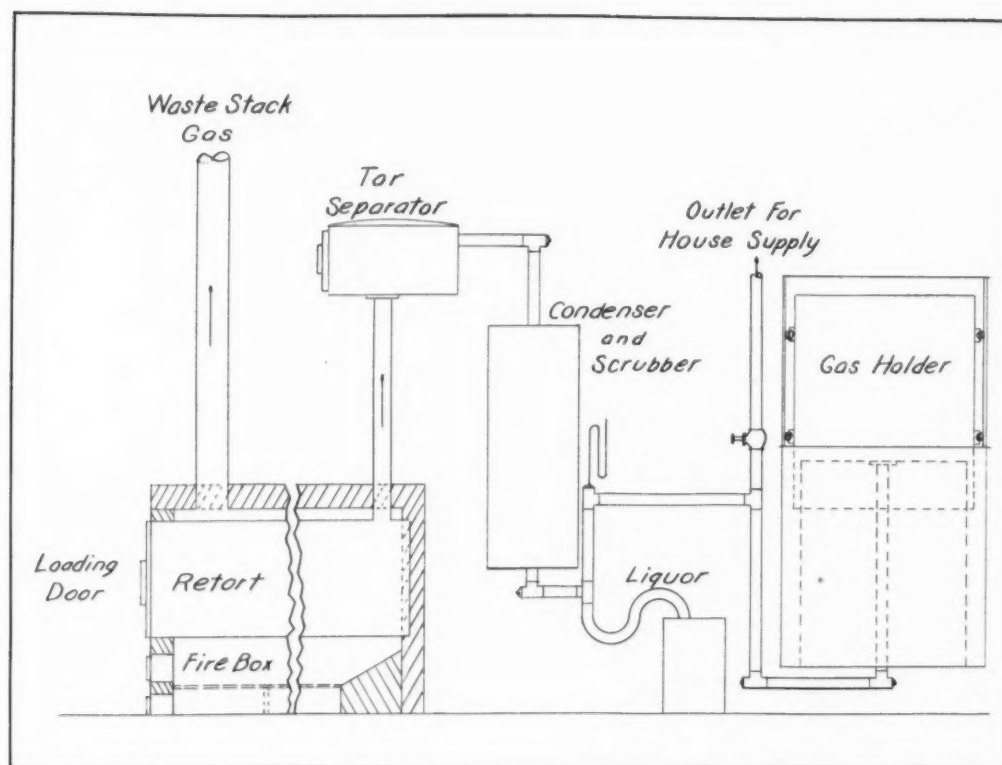
Certain farm wastes, which are to be found practically everywhere, will produce light, heat or gas under various conditions. The general problem of utilizing these farm wastes is one of great national economic importance, inasmuch as a financial return from these wastes, either directly or indirectly, would increase the farm income. Such materials as corn cobs, cornstalks, oat hulls, rice hulls, wheat straw, nut shells,

tobacco stems, and the like, are annually obtainable, and wasted, in enormous quantities, although attempts are made to utilize them partly. Straw and cornstalks are now fed to live stock, tobacco stems are used for fertilizer, cobs find use as fuel, and so on. In the east, where small farms and diversified crops are the rule, it is probable that no large excess of these wastes exists, and it will be noted that this condition applies more particularly to thickly settled areas where other sources of light, heat and power are readily available. In the agricultural states west of the Mississippi River, however, where farms are larger, communities more widely scattered, sources of fuel and power and manufactured gas are less available and the size of crops relatively much larger, tremendous quantities of these wastes lack utilization at the same time that heating problems are usually more acute, because of the severer winters on the plains. Some means of generation of heat and power from these waste materials, in such areas, would therefore have tremendous significance.

There are at least four possible means of generating light or heat from such materials. They may be burned directly in suitable stoves, or converted to charcoal and burned; they may possibly be utilized in the form of charcoal to produce gas in certain forms of charcoal gas generators; they may be destructively distilled in suitable retorts to produce gas and charcoal; or they may be fermented to produce a burnable gas. All of these possible methods are being studied at the Agricultural By-Products Laboratory of the U. S. Department of Agriculture, Bureau of Chemistry and Soils, in cooperation with the Iowa State College, at Ames, Iowa.

Study of the first, or direct fuel method, has been limited to the possibility of producing briquets from wastes for use as direct fuel. It may be feasible to install briquetting machinery on a truck and go from farm to farm, producing compact fuel from such local wastes as might be available. Farm wastes are light and bulky, and the cost of collecting and transporting them is expensive. Furnaces for burning them require large fire areas and frequent replenishing because of the flimsy nature of the materials, so that generally only corn cobs are successfully used for fuel, especially as the average furnace or stove is usually designed for a compact fuel. However, by the compression of such materials into briquets, on the farm, the cost of transportation of wastes is largely avoided and a compact fuel material, comparable to wood, is secured for a minor cash outlay. Against this must be considered the cost and depreciation of compressing equipment, the cost and transportation of

1. DIRECT FUEL METHOD



SMALL ASSEMBLY FOR DESTRUCTIVE DISTILLATION

tar or other binding materials for the briqueting, and the time and labor involved. If the total cost of the operation exceeds the comparative value of other available fuel, the scheme becomes impractical.

2. GAS FROM CHARCOAL

The generation of gas from charcoal in special units has not been considered to any degree, in the experimental work, because this phase has received some commercial exploitation, and because of the general impracticability of the production of charcoal from light-structured wastes by individual farmers.

3. DESTRUCTIVE DISTILLATION

Considerable attention has been given to the problem of producing heat and gas by the destructive distillation of wastes in small, specially designed retorts. A number of commercial groups have designed and attempted commercially to exploit suitable apparatus for this purpose, with uncertain success. These gas-producing machines essentially consist of a closed iron retort in which a charge of material is placed; a fire box whereby the retort is heated, generally by use of additional quantities of the same waste material; a condenser for removing the water, acid, and tar, and a storage tank for the gas. The more compact or dense the raw material used, the more gas secured per charge. Wood or sawdust could be distilled, also.

Various designs have been evolved which frequently attempt to increase the efficiency of the process by securing more adequate gas production from a given weight of material by further decomposition of the residual tars, charcoal, and so on. There is little which is patentable on devices of this character, but the commercial exploitation usually is done under assembly patents which often may not prove to be valid under litigation, and sometimes unwarranted claims are made for the economic efficiency and operation of the unit.

DESTRUCTIVE DISTILLATION

Insufficient consideration has been given by the public to the many factors involved in an operation of this character. These include the collection and storage of a daily quantity of from 100 to 200 pounds of inflammable material, the labor and attention of collection, charging, distillation, cleaning and repair of apparatus, and disposal of by-products, besides the initial cost of installation, which probably will exceed \$500. Furthermore, the operation is actually a chemical engineering one, and is subject to certain fire and explosion hazards. While gas can certainly be produced in quantities of from 8 to 14 thousand cubic feet per ton of cellulosic wastes, depending upon the temperatures used and the particular design of the equipment, it must be remembered that for a considerable period at the start of the distillation only carbon dioxide is evolved, which is without any fuel value, and for a further period at the end the evolved gas is mostly hydrogen, which has comparatively small fuel value. The analysis of the mixed gas from a complete run may approximate:

Carbon dioxide	45% - 32%
Methane	25% - 30%
Carbon monoxide	15% - 20%
Hydrogen	10% - 15%
Illuminants	3% - 3%

of which only the illuminants and methane have high calorific value. Various retort manufacturers have attempted to increase the fuel value of the gas by passing the carbon dioxide over heated charcoal, reducing the carbon dioxide to carbon monoxide, or even by enriching the gas by bubbling it through gasoline and the like, but no prediction can be made as to the actual day-by-day value of gas secured by an untrained operator from the usual apparatus. Considerable quantities of a water, tar, acid mixture of a pungent odor will result as a by-product which must be disposed of. It is our opinion that a distillation process of this character could be more logically applied in central distillation plants

in isolated small communities, whereby sufficiently adequate amounts of materials could be distilled to justify the employment of a trained chemical engineer to supervise the operation, and where by-products would be accumulated in sufficient amounts to pay for reclaiming and selling them, the resulting noncondensable gas being possibly scrubbed, purified, stored and distributed to homes of the community. While the figures vary for different raw materials, it may be generally stated that a ton of farm wastes would yield 400 to 600 pounds of carbon, 800 pounds of acid water and tar, and 8,000 to 14,000 cubic feet of gas (including CO_2), depending on temperature and design, and the greater or lesser destruction of portions of the tar and charcoal.

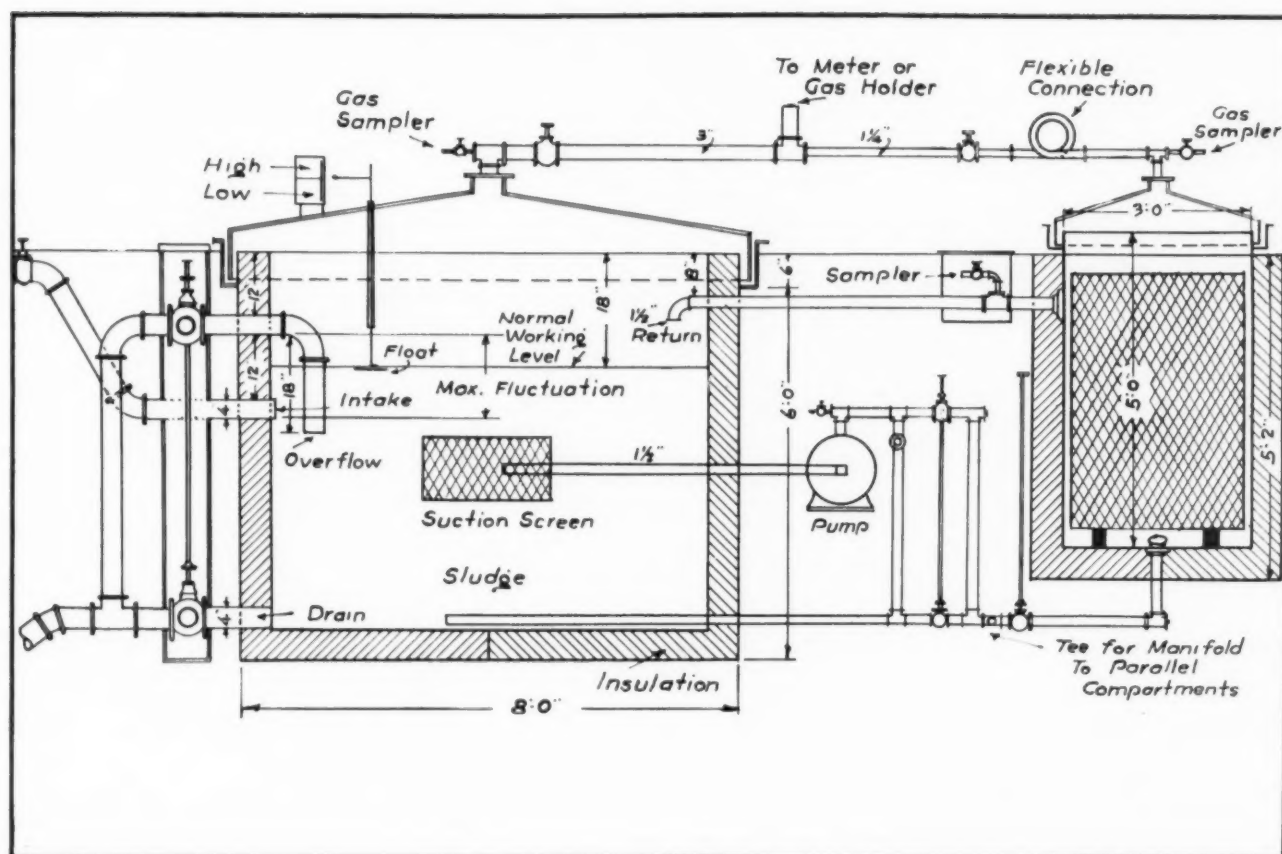
Installations of this character should be housed in a separate building, located some distance from other farm buildings. The building should have a metal roof and a dirt or concrete floor. A preferable form would be constructed entirely of metal siding on a frame of wood studding. The sides and roof of the building should be well away from the operation. The gas holder must be protected from freezing. Interior space should be adequate to allow for some storage of fuel materials indoors, but at a safe distance from the retort. The retort neck and pipe accessories must be kept free from tar and dust, otherwise explosions may occur. If straw or other fuel is used, the stack outlet outside the building should be covered with a spark screen.

4. FERMENTATION OF VEGETABLE WASTES

Especial interest has been shown by the public on a possible process of fermenting cellulosic farm wastes for the production of gas. Here again, as in the retort process, many involved problems are encountered. At least \$500 to \$750 must be invested in the equipment; the storage and collection of and handling of suitable quantities of wastes must be undertaken; and considerable daily attention must be paid to the functioning of the process. It may be estimated that 10,000 cubic feet of gas of 500 B.t.u. value are obtainable from a ton of wastes. At higher fermentation temperatures (55°C.) this gas consists approximately of 50% carbon dioxide, 25% methane, 25% hydrogen. At mesophilic temperatures (30°C.) the gas approximates 50% carbon dioxide, 50% methane. Such gases can be burned without difficulty in the usual equipment without removing the carbon dioxide (although such removal would increase the heat value), but the fermentation is slow and therefore a much larger space and equipment is necessary than with a retort process. In attempted operation many technical difficulties will be encountered.

Farm wastes will not successfully ferment and generate gas without the presence of nitrogenous bodies to aid the bacterial growth. Absolute control of temperature is essential, development of acidity must be prevented, periodical fresh additions of new materials are required, proper dilution must be maintained, the design must function under varying evolution rates while delivering gas at definite pressure, and the hazards of gas leaks must be controlled. In the process of fermentation, the water soluble extract of the wastes is first broken down, followed by a gradual attack upon the vegetable structure, pentosans and cellulose being removed slowly, and lignin remaining mostly unattacked. A residue thus remains for disposal. The decomposing materials seem to form acids as an intermediate decomposition stage, and these acids must be continuously broken down and kept from forming pockets, otherwise the fermentation will be retarded. This may be accomplished either by stirring the mass or by circulating the fermentation liquid through the mass under pressure. In the apparatus evolved by Dr. A. M. Buswell of the University of Illinois, a charge of cornstalks is placed in a wooden generator containing the bacterial sludge, and the mass is frequently agitated by means of a hand-operated stirring mechanism, fresh additions of cornstalks and equivalent removals of semi-decomposed materials being made at intervals, either ammonia salts or sewage being used as a nitrogen source. In the system being experimented with at this laboratory, a more positive control was sought and the pumping system is used, the apparatus in use at present being shown in schematic design in the accompanying sketch. At least a ten-day fermentation period is required.

Essentially the apparatus consists of an air-tight, insulated cesspool about 8 feet in diameter and 6 feet deep, in which the main bulk of the sludge liquid is collected and stored. Chopped cornstalks are placed in convenient wire baskets holding about 90 pounds and inserted in various compartments of a separate digestion tank, about 10 by 5 by 3 feet in size, the compartments receiving fresh charges in turn periodically, so as to maintain a continuous evolution of gas by replacing part of the spent material with fresh stalks. Air is excluded from the entire apparatus and the escape of gas prevented by means of water seals. The nitrogenous liquid (chiefly barn drainings) in the cesspool is periodically pumped through the cornstalk baskets to wash out the soluble breakdown compounds from the cornstalks, the liquid returning to the cesspool where further decomposition occurs. Gas is stored in an appropriate gas holder (100 cubic feet capacity). Experimentation on the



GAS GENERATING PLANT FOR FERMENTATION OF VEGETABLE WASTES

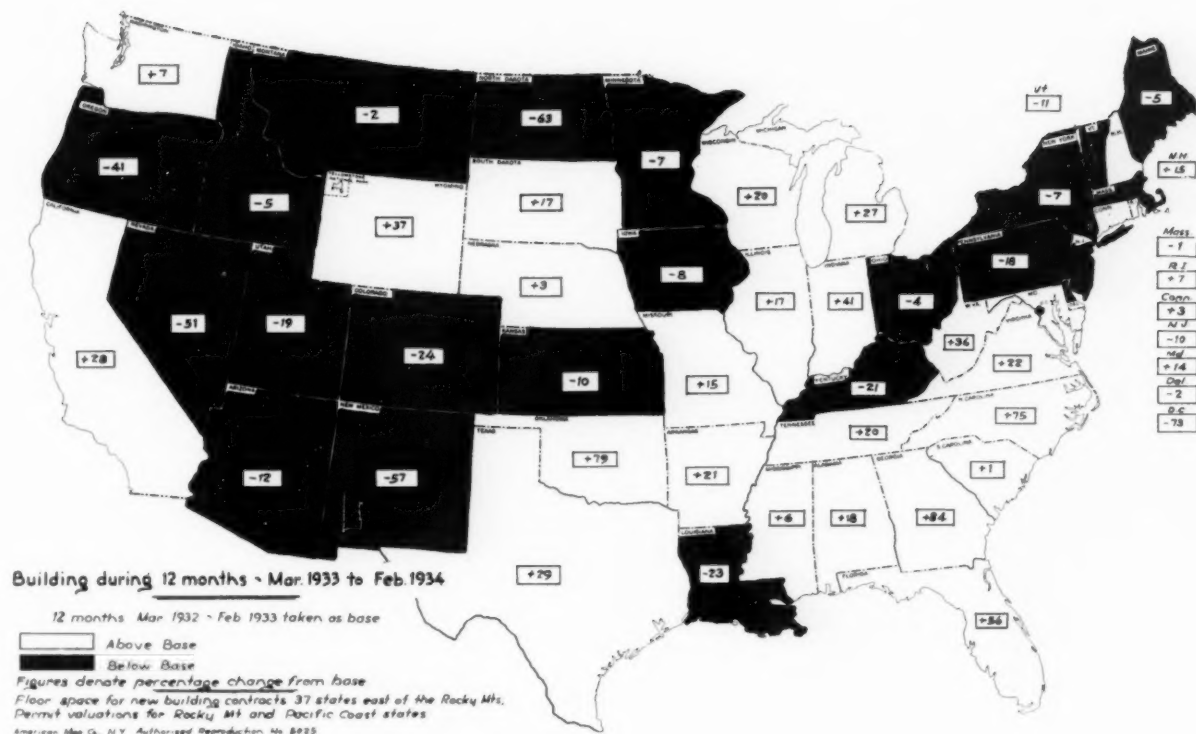
use of house sewage as a source of nitrogen was abandoned because of sanitary reasons, and because of the fact that house sewage contains large amounts of wash water which merely dilute the cesspool contents without adding much nitrogen value. The use of ammonia salts instead of sewage is possible. The experimentation is far from complete and the design shown is largely tentative, and the process cannot be said to be of proved economic value as yet.

A fermentation plant should be housed in a barn or reasonably well-protected building. Cesspools and digestion tanks may preferably be sunk below ground level, but should be surrounded by insulation. The gas holder may be located elsewhere, if protected from freezing. It is advisable to place the units as close together as possible, and a small chain hoist, for lifting the baskets of spent cornstalks, will be a great con-

venience. Either hand or electric driven pumps may be used. Great care must be taken to locate the plant at an exact level, in respect to the sewer lines, as shown. If the depth shown in figure is not obtainable, the cesspool may be made larger in diameter and smaller in depth.

It will be seen from the above that the general problem of heating farm homes by the use of farm waste products involves so many economic factors that no definite prediction can be made, at this time, as to the probable economic success of the various proposed methods in the hands of nontechnically trained operators. It was shown by Roethe in 1923 (U. S. Department of Agriculture Bulletin No. 1203) that the gas produced from straw by destructive distillation in a commercial unit (designed to break down most of the residual carbon and tar so as to secure a large yield of gas while at the same time utilizing these unwanted by-products) cost approximately \$2.36 per thousand cubic feet. By the fermentation method, using purely arbitrary charges for materials, labor, and interest and depreciation on a plant costing \$750 (estimated to produce 200 cubic feet per day) a cost of \$1.75 per thousand cubic feet might be tentatively arrived at. However, dependence of such a unit for supplying the home entails a reasonably continuous day-by-day operation, and on maintaining sufficient quantities of gas of the correct constitution, at definite pressure. Since the average farmer operates under both slack and rush seasons, conditions might arise where the necessary labor and attention could not be given to the producer unit. True, the slack season comes partly in winter, when gas requirements may be highest, but winter conditions might also slow up a fermentation operation, unless the equipment is adequately housed. In view of all these contingencies, therefore, no investment should be made in generating devices of this character without a careful study and analysis of all the factors involved.

COSTS



CONSTRUCTION PUSHES AHEAD

By L. SETH SCHNITMAN, Chief Statistician, F. W. Dodge Corporation

MATERIAL PRICE MEASURING ROD

The prices in this tabulation enable one to visualize at a glance the main trend of the material market. Their significance does not extend beyond that point, and the explanation below should be read carefully.

F. W. Dodge Corporation Composite Prices as Indicated in Explanation

Material	This Month	Month Ago	Year Ago
Portland Cement...	\$2.26	\$2.26	\$2.05
Common Brick....	12.36	12.36	11.70
Structural Steel...	1.65	1.65	1.60
Lumber.....	16.50	16.50	15.48

Prices given in this comparison are composite and do not in all cases refer to one item. For instance, the price of structural steel is the composite of prices of shapes and plates f.o.b. Pittsburgh; the price of lumber is a composite of five items of Southern pine and five items of Douglas fir f.o.b. mill; the price of cement is a composite of prices in fourteen different cities per barrel, carload lots, to contractors; price of brick is composite in fourteen cities per M, delivered on the job.

March contracts for construction of all descriptions amounted to \$179,161,500; this was almost twice the total reported for February and about three times the volume of March, 1933. Increases over both the previous month and March of last year were scored in each of the four principal classes of construction.

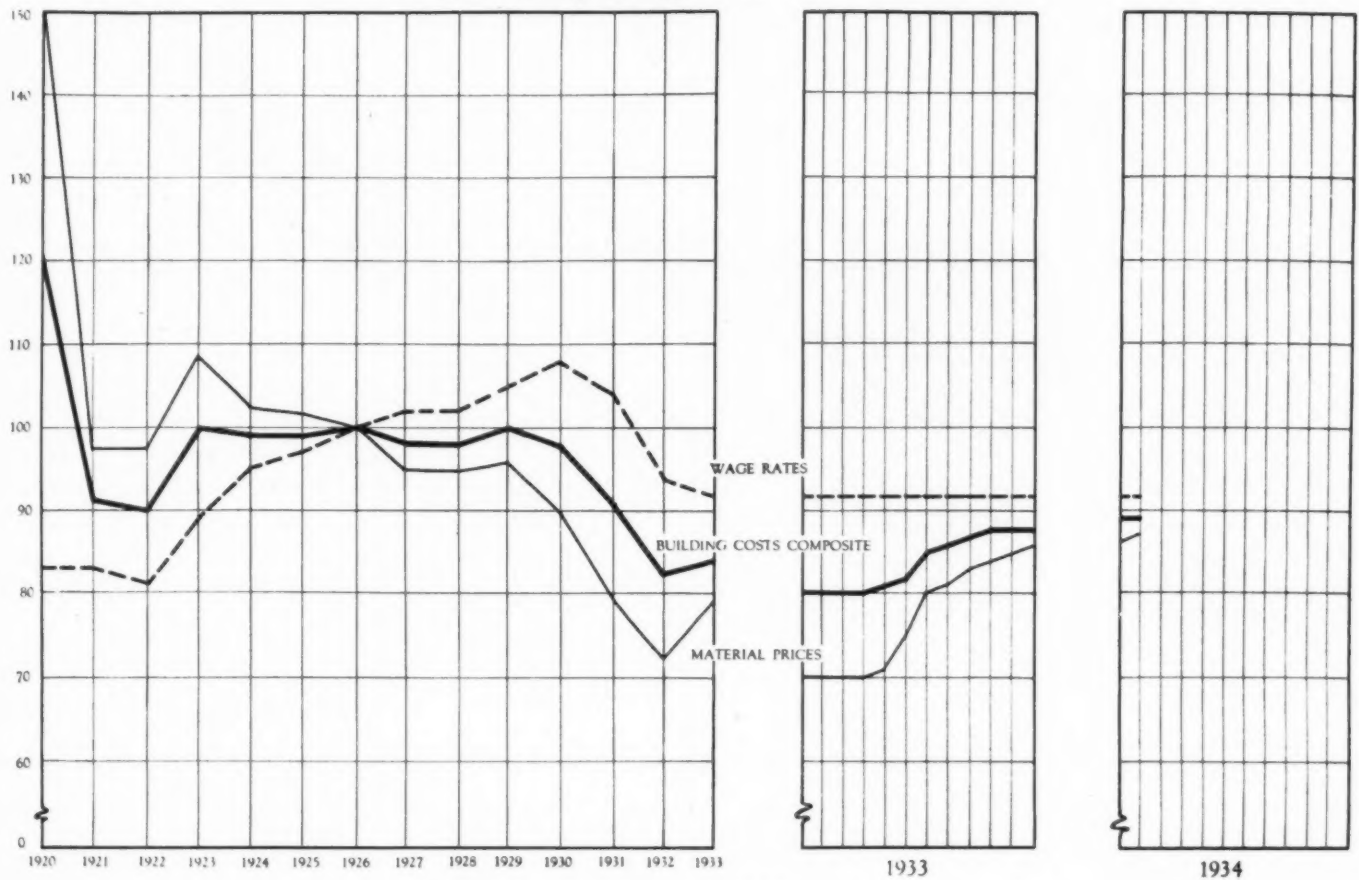
For the first quarter of 1934 contracts totaled \$462,341,500, as contrasted with only \$196,026,800 in the corresponding quarter of 1933. For residential building the gain over 1933 to date amounted to about 46 per cent; for nonresidential building the increase was almost 85 per cent; for public works the 1934 volume was more than three and one-half times the size of the 1933 total; while for public utilities the first quarter's total was about two and one-half times as great as in the corresponding period of 1933.

Contracts awarded in March showed gains over February in each of the thirteen Dodge districts except southern Michigan, where a relatively unimportant decline was reported. Gains over March, 1933, were universal throughout the 13 districts. Likewise, for the initial quarter of 1934 contracts showed gains over the corresponding quarter of 1933 in each of the 13 districts without exception.

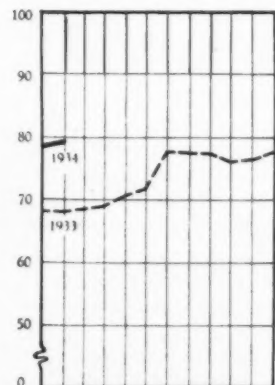
During the second quarter of 1933 contracts for all classes of construction in the 37 states as a whole totaled \$236,086,600. For the second quarter of 1934 contracts in the same territory should exceed \$325,000,000 by a fair margin. Of the contract volume for the second quarter of the current year it is probable that at least 70 per cent of the total will represent publicly-financed undertakings. During the initial quarter of the year this class of work, totaling almost 350 millions, represented 75 per cent of the contract total.

MATERIAL PRICES, BUILDING WAGE RATES AND BUILDING COSTS COMPARED

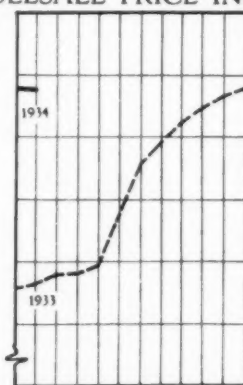
1926 Monthly Average = 100



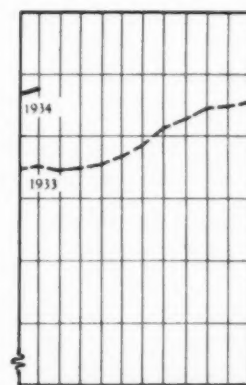
WHOLESALE PRICE INDEXES



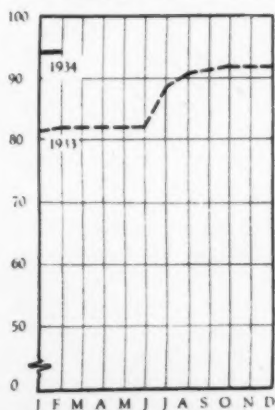
PAINT MATERIALS



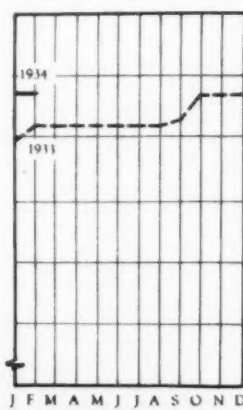
LUMBER



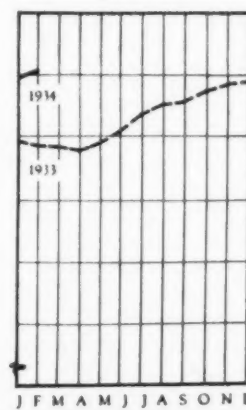
BRICK AND TILE



CEMENT



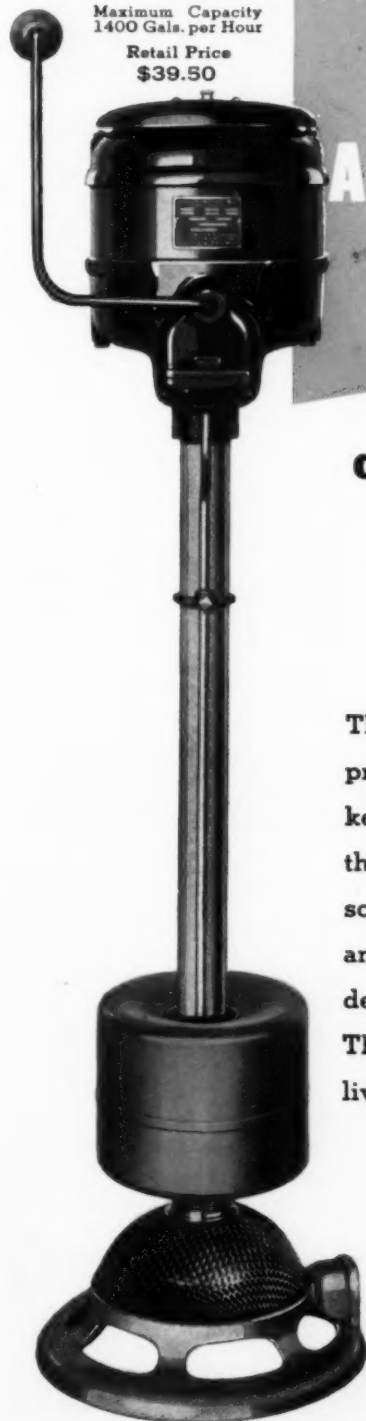
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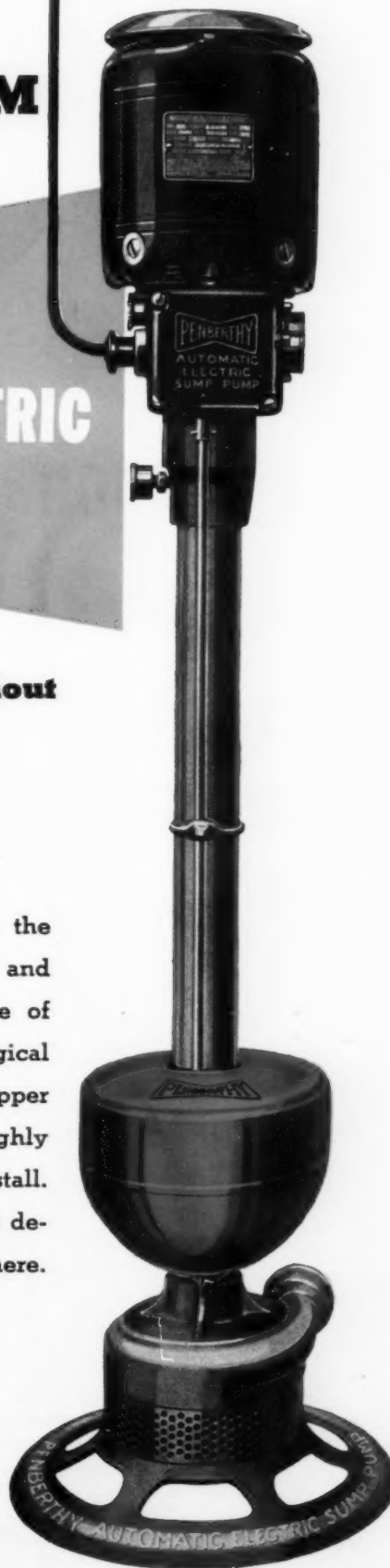
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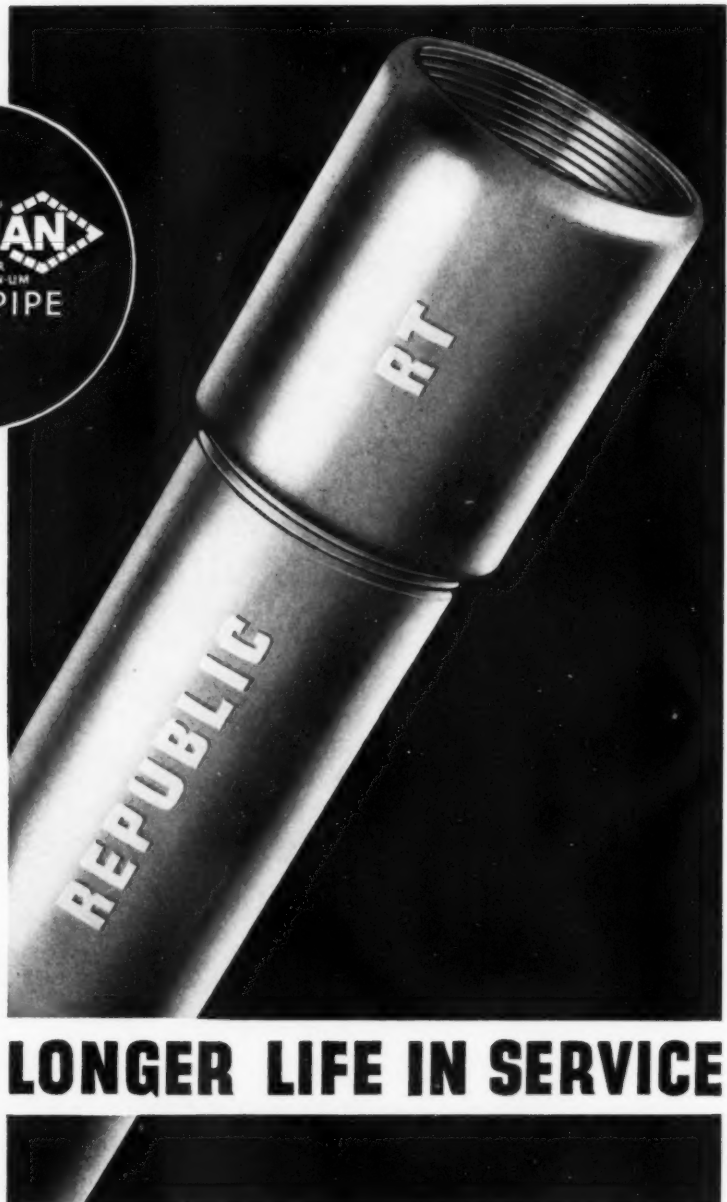
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GENERAL OFFICES



YOUNGSTOWN, OHIO

RELATION OF LAND COSTS TO RENTALS IN HOUSING PROJECTS

BY NORBERT BROWN

EDITOR,
REAL ESTATE RECORD
AND BUILDERS' GUIDE

THOSE engaged in the housing movement in this country and particularly in New York have been attracted to the theory that low land cost is the most important single factor in providing low-rental housing. The acceptance of this theory has led to the general appreciation of decentralization as a necessary concomitant of the low-cost housing and slum clearance movement.

It may be said, and with considerable factual basis, that decentralization will not appreciably relieve slum conditions because it would involve the moving of slum dwellers to suburban areas; but it has been demonstrated that slum dwellers are attracted to their insanitary, unhealthful accommodations by the low rents and the convenience of short traveling distance to places of work.

While there is no indication at present that sufficient funds will be available from any source to eliminate slum conditions on any appreciable scale, the fact remains that what comparatively small sums are to be expended could be concentrated on improvement of the worst slum areas in metropolitan regions.

In the eleven New York limited dividend corporation projects erected between 1927 and 1932, and now being operated under the supervision of the State Board of Housing, it has been clearly demonstrated that land prices are not directly reflected in the room rentals (see Table 1).

Table I gives data on average room rentals, land costs per room and construction costs per room in the eleven developments erected and operated under the supervision of the State Board of Housing.

TABLE 1. COMPARATIVE DATA PERTAINING TO NEW YORK PROJECTS

	Average Rental Per Room	Land Cost Per Sq. Ft.	Land Cost Per Room	Construc- tion Cost Per Room
AMALGAMATED HOUSING CORPORATION				
First 6 units.....	\$9.86	\$2.02	\$252.74	\$1,373.21
Units 7 and 8.....	9.86	3.08	224.92	1,234.04
Unit 9.....	9.86	3.02	185.19	1,094.33
AMALGAMATED DWELLINGS, INC.....	12.22	5.61	369.04	1,206.70
FARBAND HOUSING CORPORATION.....	9.73	2.46	164.34	1,200.92
BROOKLYN GARDEN APARTMENTS, INC.				
Fourth Avenue project.....	9.99	2.52	150.60	952.16
Navy Yard project.....	10.75	3.27	185.66	859.45
ACADEMY HOUSING CORPORATION.....	10.93	1.40	110.45	1,008.57
STANTON HOMES CORPORATION.....	12.33	10.00	692.04	1,361.50
MANHATTAN HOUSING CORPORATION.....	12.39	5.56	353.03	1,343.65
STUYVESANT HOUSING CORPORATION.....	12.50	9.27	531.83	1,096.05
Average	\$10.76	\$2.89	\$229.96	\$1,137.50

TABLE II. DISBURSEMENTS OF ROOM RENTAL INCOME AND RENT DOLLAR IN ELEVEN STATE HOUSING BOARD PROJECTS IN 1932

	Rent Dollar	Room Rental Income
Interest payments	\$0.3346	\$3.60
Depreciation	0.1722	1.85
Taxes	0.0476	.51
Insurance	0.0245	.26
Wages	0.0680	.73
Fuel	0.0775	.84
Water	0.0155	.17
Repairs	0.0200	.22
Electricity	0.0226	.24
Janitorial Expense	0.0076	.08
Exterminating	0.0013	.02
Elevator Expense	0.0048	.05
Garden Expense	0.0014	.02
Renovating	0.0613	.66
Administration	0.0455	.49
Miscellaneous Operating Expense.....	0.0053	.06
Surplus	0.0896	.96
Total	\$1.000	\$10.76

The average monthly rental per room in the eleven State Housing Board projects in 1932 was \$10.76. The disbursement of the rent dollar and room rental income is shown in Table II.

Omitting the interest payments, taxes and surplus, thereby reducing the disbursement of rental income to the barest operating and maintenance charges, it is found that the cost of administering the properties is \$5.69 per room per month.

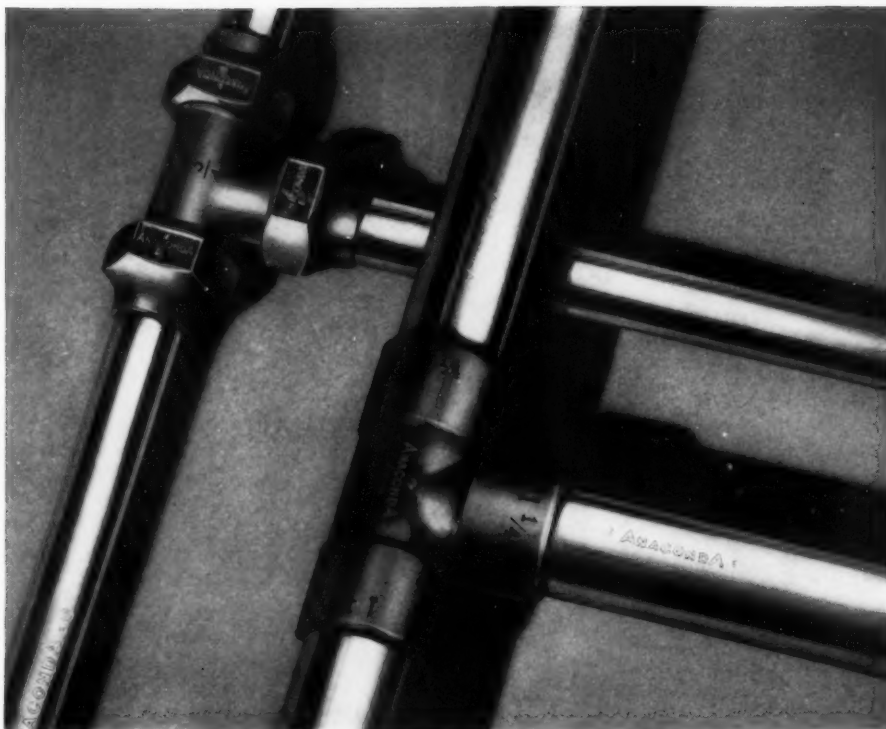
So far as administration of properties of this kind is considered, the cost of \$5.69 per room per month represents the lowest possible rental on a "self-sustaining" basis, were the land and construction costs donated outright, were no charges made for the use of capital involved, nor were any taxes assessed against the properties, nor was any surplus set up or profit distributed.

What effect would increased land values have on the monthly room rental in these identical projects, allowing for uniform increases in taxes, uniform increases in interest payments attributable to land investment, and uniform increases in surplus, figured at a constant percentage of return on investment?

The tax rate is figured at 2.218 per cent (the buildings are tax free), the interest at 4.7376 per cent on two-thirds of the land cost and the surplus is figured at 8.9 per cent of the total rental received. These rates, herein enumerated, represent the actual rates as applied to the eleven State Housing Board projects in 1932, the last year for which a complete report is available.

It is seen that this discussion must take into account the *constant* cost attributable to the buildings themselves and the *variable* cost attributable only to the land.

The average constant costs attributable to the buildings only, and reduced to a monthly per room basis, are \$8.68. The *constant* figure represents interest payments on buildings, depreciation, insurance, wages, fuel, water, repairs, electricity, janitorial expense, exterminating, elevator expense, garden expense, renovating, administration, miscellaneous operating expense and surplus. All these items constituting the charges against the buildings are based on the experience shown in Table II.



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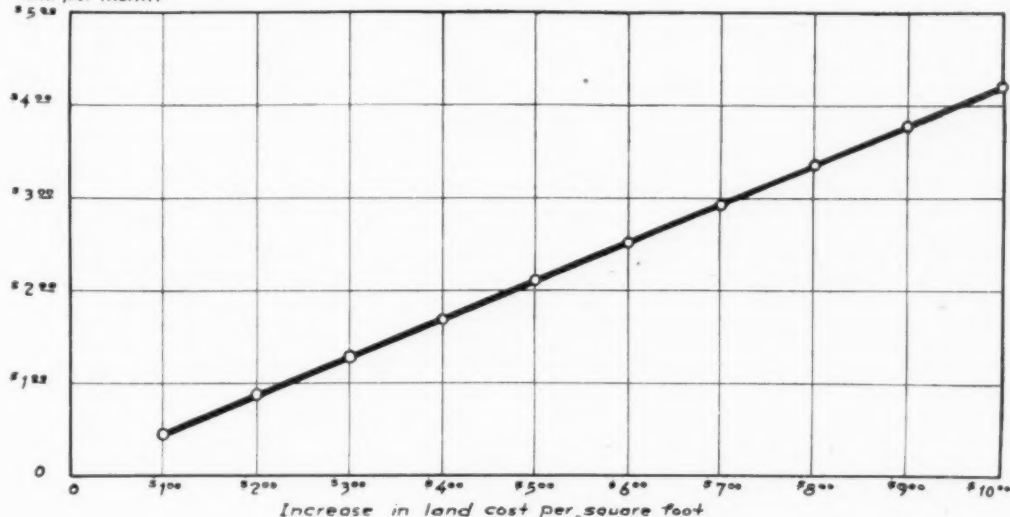


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TABLE III. EFFECT OF LAND COSTS ON MONTHLY ROOM RENTALS IN HOUSING PROJECTS, BASED ON EXPERIENCE OF LIMITED DIVIDEND CORPORATIONS IN 1932

	Land Cost 89 cents per square foot	Land Cost \$1.89 per square foot	Land Cost \$2.89 per square foot	Land Cost \$3.89 per square foot	Land Cost \$4.89 per square foot	Land Cost \$5.89 per square foot	Land Cost \$6.89 per square foot	Land Cost \$7.89 per square foot	Land Cost \$8.89 per square foot	Land Cost \$9.89 per square foot	Land Cost \$10.89 per square foot	Land Cost \$11.89 per square foot	Land Cost \$12.89 per square foot
Fixed Building Operating Cost	\$8.6852	\$8.6852	\$8.6852	\$8.6852	\$8.6852	\$8.6852	\$8.6852	\$8.6852	\$8.6852	\$8.6852	\$8.6852	\$8.6852	\$8.6852
Land Tax	0.1600	0.3100	0.5100	0.6800	0.8600	1.0300	1.2100	1.3800	1.5600	1.7300	1.9000	2.0800	2.2500
Interest on Land	0.1866	0.3958	0.6050	.8142	1.0233	1.2325	1.4417	1.6508	1.8608	2.0700	2.2792	2.4883	2.6975
Surplus 8.9%	0.8800	0.9200	0.9600	1.0000	1.0400	1.0700	1.1100	1.1500	1.1900	1.2200	1.2600	1.3000	1.3400
Rental per room	\$9.9118	\$10.3310	\$10.7602	\$11.1794	\$11.6085	\$12.0177	\$12.4469	\$12.8660	\$13.2960	\$13.7052	\$14.1244	\$14.5535	\$14.9727

Increase in
Rental per
Rm. per month



The *variable* figures, attributed to land only, include interest payments on the land, taxes on the land, and the increase (in cents) on the land investment attributable to the surplus.

It is clearly demonstrated in Table III in the eleven projects operated under supervision of the State Board of Housing in 1932, that 10.3 per cent of the actual rental, or \$1.11 out of each \$10.76 of rental, is attributed solely to land carrying charges (interest and taxes) when the land costs \$2.89 per square foot.

If the land cost 89 cents per square foot, then the carrying charges for the land only would be 35 cents per room per month or 3.5 per cent of the total rental. However, if the land were to be increased to \$12.89 per square foot, exactly \$10 more per square foot than the land for the projects did actually cost in the eleven developments, it is found that the carrying charges for the land would amount to \$4.95 per room per month or 33 per cent of the total rental. In other words, with a \$10 increase in land cost, from \$2.89 per square foot to \$12.89 per square foot, the actual increase in rental attributable solely to the land would be \$4.21 cents per room per month.

As it has been clearly demonstrated, the principal charge against tenants as reflected in the rents they pay, is for interest which constitutes more than one-third of the monthly room rental. It seems reasonable to investigate methods of reducing this charge, if the main purpose of the housing developments is to provide low-rental housing.

The Federal government, however, in its housing policies as administered by the Housing Division of the Public Works Administration has stressed constantly the danger in paying prices asked for slum lands and has left the question of interest in abeyance.

It is apparent that the three most important economic factors to be considered in housing, in the order of their importance are: (1) interest payments; (2) construction costs and (3) land costs. An examination of government-aid projects will disclose that the order of importance stressed by the administrators has been listed as: (1) land costs; (2) construction costs and (3) interest.

MANUFACTURERS' ANNOUNCEMENTS

Architects are invited to use the coupon on this page as a convenient means of obtaining manufacturers' publications describing in detail the products and materials mentioned.

D 1

ACOUSTICAL MATERIALS ASSOCIATION

Test data applying to absorption coefficients and specifications of acoustical tiles, boards, blankets and plasters, also data on coefficients of ordinary building materials are available in the February bulletin of the Acoustical Materials Association. Another release, "Theory and Use of Architectural Acoustical Materials," also published by this Association, outlines the scientific principles upon which the use of sound-absorbent materials is based. Both booklets available on request.

D 2

SERVEL AIR CONDITIONING UNIT

Simplicity of design and installation, together with moderate price, are the most attractive features of a new "package"-type summer cooling and air conditioning unit brought out by Servel, Inc., as part of their complete air conditioning line for this year.

The new unit is completely self-contained and semi-portable, housing within the cabinet a refrigerating machine unit with a one-horsepower motor. An electrical connection for the motor and water and drain connections for the machine unit are the only installation requirements. This unit cools, dehumidifies and circulates. Its compactness and large capacity (approximately one ton) make the Servel model adaptable for use in homes, business and professional offices, small stores, shops, etc. Over-all measurement is $66\frac{1}{2}$ " x $14\frac{1}{2}$ " x 31". Other equipment in the Servel line includes a floor-type air conditioner for heating and humidifying as well as cooling, dehumidifying, filtering, circulating and ventilating; a $3\frac{1}{2}$ -ton capacity suspension-type unit, also for year round use and for summer cooling only; and refrigerating machine units of five and ten ton capacities for air conditioning apparatus and commercial refrigeration.

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D 3

COLOR IN ALUNDUM RUBBER BONDED SAFETY TREAD

The new Alundum Rubber Bonded Safety Tread made by Norton Company, Worcester, Mass., is now available in three colors—red, green and buff—in addition to the black originally offered. The tread was put on the market

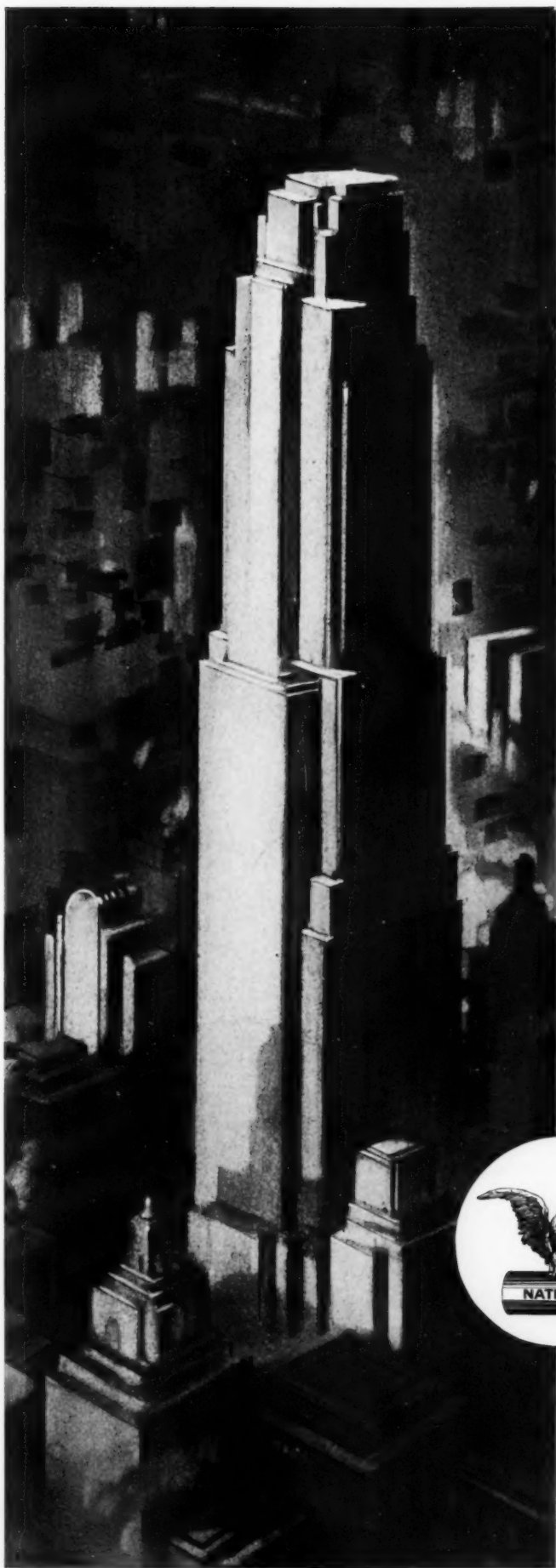
less than a year ago, became immediately popular with architects and maintenance men and a demand for colors became apparent. The colored treads are made in the same sizes as the black and are characterized by the same features. They have a surface that is highly nonslip even at the very nosing edge. The nonslip effectiveness is claimed to be permanent—the tread will not wear smooth. It has a flat level surface with nothing to catch heels or to cause tripping hazard. The treads are not affected by weather conditions and their nonslip effectiveness is not lessened by water, so that they are suitable for outdoor as well as indoor use. They are extremely resistant to wear and can be expected to give a building-life of service even where traffic conditions are severe.



D 4

NEW PRINCIPLE OF ALUMINUM PAINT PROCESSING

By successfully exploding the powder lumps, which are bound to form during the processing of aluminum paint, Aluminum Industries, Inc., Cincinnati, Ohio, claims to have developed an aluminum paint that spreads better, gives more thorough coverage and fuller protection. During the paint manufacturing process, aluminum bronze powder particles tend to group together in clusters, having from 4 to 50 particles in a lump. By applying a high 31-inch vacuum to the paint, according to manufacturer's description of new process, the air imprisoned within the lump is released with an explosive effect. Tests have proved, says the Company's release, that aluminum paint exploded by this vacuum process spreads more easily and keeps a uniform brilliance because there are no lumps present to roughen the surface. Further information about this process and its application in the manufacture of Permite aluminum paint will be furnished to interested readers.



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FOR PIPE

American architecture, through its leaders everywhere, and for all types of buildings, registers one dominant choice in its consideration of pipe. Long accumulated experience in designing and in the scrutiny of materials, careful observation of results in use, a developed sense of responsibility to clients—all these have entered into the collective judgment of the architect. It is by preeminence in service that NATIONAL Pipe has become preeminent in favor. On merit alone it has won its place in the most noteworthy buildings of recent years. Pipe adapted to the routine uses of plumbing and heating—tubes of costly and marvelous alloys for highly exacting demands, whether ornamental or structural—pipe and tubes of shapes, dimensions, and properties to cover the whole range of specification are offered under the name NATIONAL by the largest manufacturer of tubular products in the world.

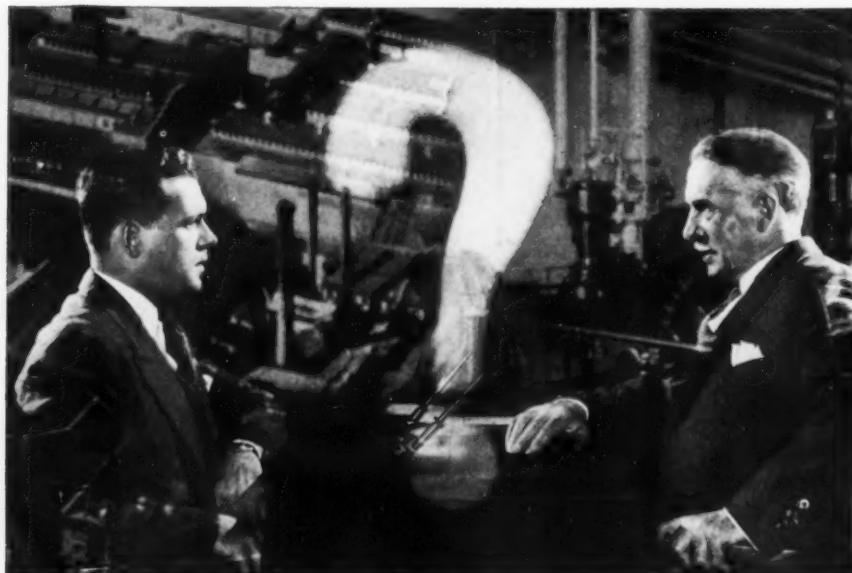
NATIONAL TUBE COMPANY, Pittsburgh, Pa.
Subsidiary of United States Steel Corporation



NATIONAL PIPE

AMERICA'S STANDARD WROUGHT PIPE

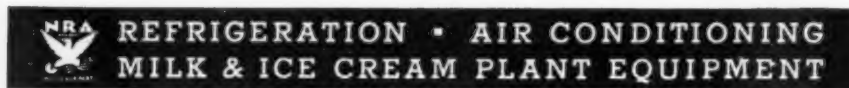
THE CUSTOMER IS NOT ALWAYS RIGHT



... But Neither Are We

No company whose history has been linked with industrial progress over a period of years would presume to lay claim to a record of 100 per cent freedom from trouble with every installation, despite the thousands of successful ones it may have to its credit. But there are those who can point to an enviable record of customer satisfaction based on 100 per cent correction of such troubles. The mistakes one makes are not in themselves a foundation for success. Rectifying them at no cost to anyone else, is.

YORK ICE MACHINERY CORPORATION • YORK • PENNSYLVANIA



D 5

NEW DELCO BOILER

For residences and small commercial applications requiring low-pressure steam Delco Appliance Corporation of Rochester, N. Y., is producing the Delco Heat Boiler combining an oil burner, a boiler and an economical domestic hot-water heater. It is a single, compact and automatic unit. Radiation: steam, 1,050 square feet; hot water, 1,680 square feet. (Figures on basis of total load.) Water

capacity: steam, vapor, vacuum, 40.5 gal. Hot water, 55.5 gal. The boiler is cast iron sectional type of 7.6 horsepower. Heating surface increased by use of fins. Heat energy is transferred to sheet of water in the fins, creating quick steaming and circulation. The boiler can be taken into any basement without altering building. Complete information about the new boiler is contained in an illustrated specification folder available on request.

D 6

LUMINOUS FOUNTAINS

Luminous fountains are the subject of a sixteen-page publication issued by the Westinghouse Electric and Manufacturing Company. For estate gardens, public parks and memorials, plazas and building and apartment house courts Westinghouse has developed three standard types of illuminated fountains: a small pool type, a medium size pedestal type, and a large basin pool type fountain, each supplied complete from lights to control station.

The booklet describes how fountains may be enhanced in beauty by harmonious color blends from underwater lights tinting the streams and falling spray with changing color. The equipment, from lights to control, is illustrated. Also, plan and elevation drawings and water and color lighting effects are shown. Color illustrations show several fountain installations including night views of the Capital Plaza, Washington, D. C., Bell Isle Fountain, Detroit, Michigan and others.

D 7

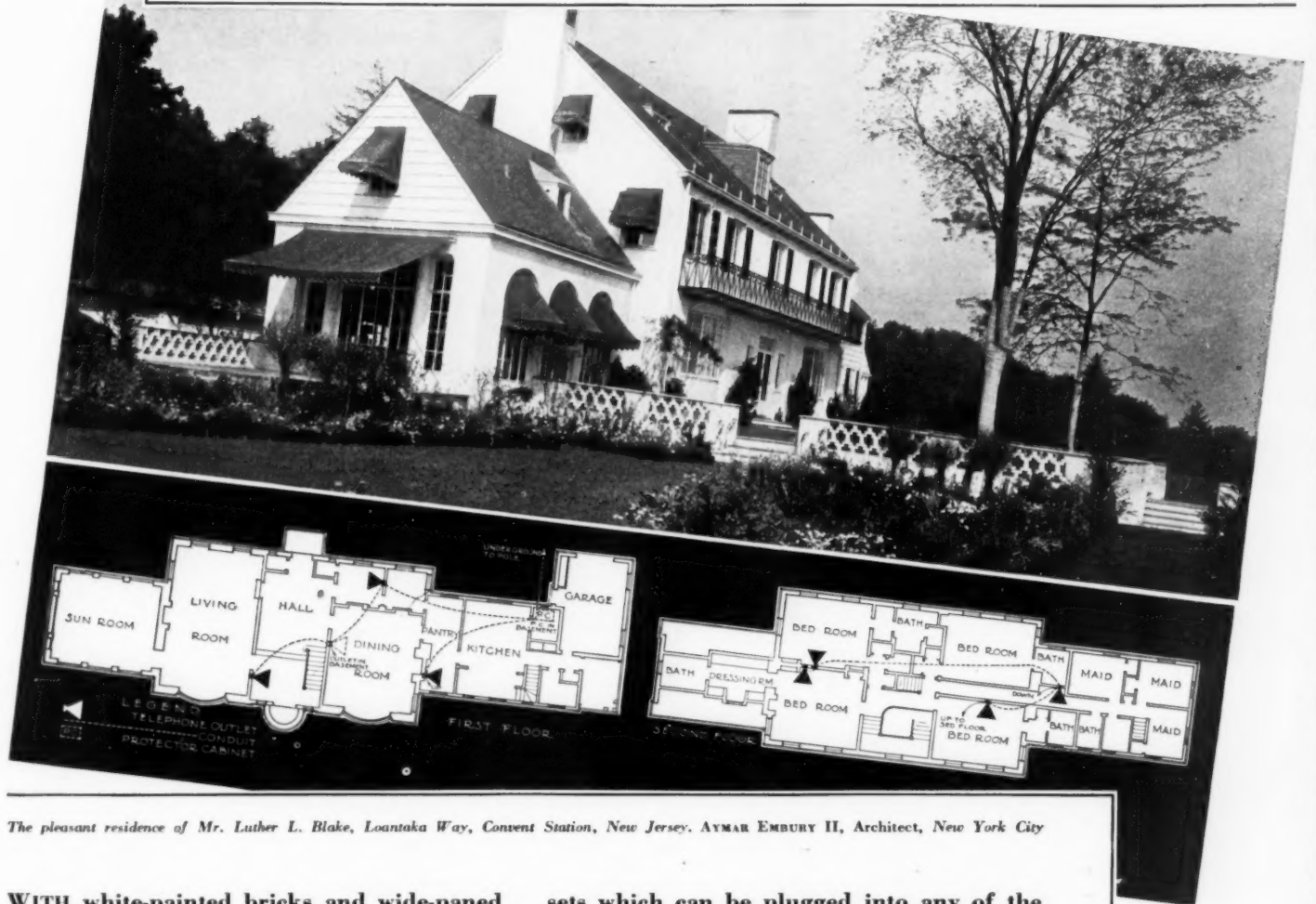
GENERAL ELECTRIC OIL FURNACE AND AIR CONDITIONING

Produced in A.I.A. file size and written especially for the architect, two pamphlets, one dealing with the oil furnace and the other with the air conditioning system, are offered by the General Electric Company.

The General Electric oil furnace contains in one coordinated unit, burner, welded steel boiler, domestic hot-water heater and all controls required for completely automatic operation. Available in two sizes, the General Electric oil furnace is designed for either steam, vapor or hot-water heating.

The General Electric air conditioning system for winter consists essentially of the General Electric air conditioner, type AA-3, operating in conjunction with a G-E oil furnace and a distribution system of supply and return air ducts. It is designed for use in residences or buildings of a similar size, and may be used either for application to old gravity warm-air heating systems or for new homes. The operation of the system is entirely automatic.

Modern telephone convenience where Washington's couriers rode



The pleasant residence of Mr. Luther L. Blake, Loantaka Way, Convent Station, New Jersey. Aymar Embury II, Architect, New York City

WITH white-painted bricks and wide-paned casements, this residence near Morristown, New Jersey, is keyed to the character of the fine old American homes around it. Where once Washington camped, with only hard-riding horsemen to carry his messages, this household can telephone to the ends of the earth, from nine convenient outlets.

The arrangements were worked out with the help of the telephone company. One outlet in the basement game room, three on the first floor, four on the second, and one in the third-floor hall. There are four permanently located telephones and two portable hand

sets which can be plugged into any of the five jack locations as needed. Buttons and buzzers provide intercommunication between the pantry and the master bedroom.

Built-in telephone conduit costs so little and returns so much — in genuine comfort — in steps, time and energy saved. Outlets can be located to meet both present and future needs. Your local telephone company will be glad to help you plan the telephone facilities for any of your residence projects. There is no charge, of course. Just call the Business Office and ask for "Architects' and Builders' Service."



D 8
NEW DEVELOPMENT IN CEILING AND PARTITION CONSTRUCTION

The Penn Metal Company of Parkersburg, W. Va. announces a new product, Lathtex. Lathtex consists of the time-tested Penn Metal Lath with a Prime Kraft board backing. This board backing is attached to the metal lath with a special metal clip.

There is enough spring in the Board, between fastenings, to permit a free flow of mortar on the back side of the lath with the Kraft Board as a form, thus producing a reinforced slab of plaster. The metal lath is embedded in the plaster. The effect of back plastering is obtained. Corrosion under exposed conditions is prevented. Lathtex provides structural strength as well as a sound retardant insulation and a perfected plaster base. The product has three uses: (1) for suspended ceilings, laced to channel irons; (2) for nailing to wooden studs in ceiling or partition construction; (3) for sheathing in stucco work.



D 9
NEW TILE FLOORING

Johns-Manville announces a new Heavy Duty Asphalt Tile Flooring for unusually severe service conditions. The outstanding characteristics of the material are its resistance to indentation and abrasion, its general strength and its ability to withstand exposure to moisture. Stores, schools, laundries, offices, public buildings, and car and bus floors are a few of the applications for this new type of flooring. It can also be applied directly over smooth

wood subfloors and may be used for installations at or below grade where dampness may be encountered. J-M Heavy Duty Asphalt Tile is made in four colors—black, red, mahogany and brown. Tiles are 9" x 9", 9" x 10", 12" x 12", and 12" x 24"; thickness 1/4".

D 10
CONTROLLED CARBON STEELS

The control of quality factors in the manufacture of steel is the subject of an interestingly illustrated booklet of 70 pages offered by Carnegie Steel Company, subsidiary of United States Steel Corporation, Pittsburgh, Pa. The booklet reviews studies that have been made to develop new methods of control in manufacturing in order to secure a steel more suited to the uses for which it is intended. It is believed that a complete knowledge of the latest improvements in steel manufacture, as given in this booklet, will better enable the users of steel to appreciate its properties in use.

D 11
KEWANEE PRODUCTS

Two releases are announced by the Kewanee Boiler Corporation of Kewanee, Ill. A brochure describing the Round Type "R" Steel Boiler emphasizes durability achieved by the use of steel and the economy in operation resulting from the employment of 2-pass tubes, an arrangement of flues whereby water in the boiler is said to absorb a larger proportion of the available heat. This reduction in heat loss is said to effect an economy in operating cost. The Kewanee round boiler is equipped with a coil for heating the domestic hot-water supply.

Another Kewanee release is the new edition of catalogue 95a illustrating and describing water heaters, garbage burners, tanks, welded and riveted.

USE DURIRON

Where absolute insurance against failure, due either to corrosion or rust, is important. Use DURIMET ducts for carrying acid fumes.

THE DURIRON COMPANY, Inc.

404 N. Findlay Street
DAYTON, OHIO

See Our Catalog in Sweet's

DURIRON

ACID PROOF

DRAIN PIPE



BRING THAT OUTDATED BUILDING UP-TO-DATE WITH ALCOA ALUMINUM

Rip out those decorative details that tend to remind tenants of "the good old days when." Substitute ALCOA Aluminum. That's how to keep a building "rented-up" today.

Specifically, use ALCOA Aluminum spandrels on the facade and see how much taller and brighter the building looks. Put in aluminum windows for greater tenant comfort and convenience. Give the lobby new aluminum entrance doors, elevator doors, fixtures and decorative details. The stores, too, will rent faster if they are modernized with ALCOA Aluminum . . . Alumilited*.

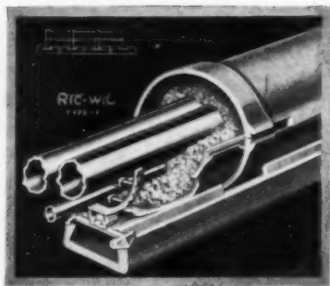
ALCOA Aluminum is strong, comparatively inexpensive, only $\frac{1}{3}$ as heavy as old-fashioned metals. That speeds up installation, lightens the load on old foundations. ALCOA Aluminum sets no limit on your design—it can be supplied in any design or finish. It resists corrosion; won't drip-stain adjoining surfaces.

ALCOA Aluminum is made in most every form from castings to extruded sections, rolled-sheet moldings, corrugated sheets, tubing, etc. We'll gladly send information on Aluminum in Architecture. Or, if you wish, our representative will call. Address ALUMINUM COMPANY OF AMERICA; 1867 Gulf Building, PITTSBURGH, PENNSYLVANIA.



*The Alumilite Process deepens and improves the natural oxide film on aluminum—gives the metal an extremely hard surface and exceptional resistance to corrosion and abrasion. Practically eliminates maintenance.

ALCOA ALUMINUM



**For underground
steam lines:**

- A completely engineered conduit system
- Delivers 90%+ efficiency
- All parts interlocking
- Asbestos Dry-paC insulation
- Variable types of construction and materials to meet all conditions
- Typical drawings and specifications on request

See our Catalog in Sweet's

THE RIC-WIL CO., 1562 Union Trust Bldg., Cleveland
Agents in principal cities

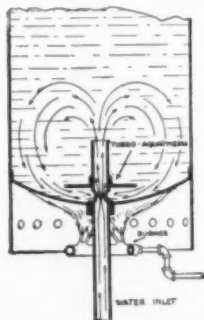
REGISTERED IN U. S. PATENT OFFICE
RICWIL
CONDUIT SYSTEMS FOR
UNDERGROUND STEAM PIPES

THE TURBO

Keeps Hot Water Clean

Supplied
in all
DAHLQUIST
Copper
Hot Water
Boilers

Saves
Gas



Prevents
Sediment
from
accumulating
and keeps
Hot Water
Clean and Fresh

Stops
Burnouts

Theodore W. Dahlquist's latest invention—The TURBO—is the only fundamental improvement made in hot water storage tanks during the past 40 years. This remarkable device supplied in all Dahlquist copper boilers absolutely stops sediment from forming on the bottom of the boiler. No need to drain a Dahlquist boiler every few weeks. The TURBO prevents mud from forming—keeps the hot water always crystal clear, fit for drinking—prevents costly burnouts—reduces cost of gas 50%.

Whether your need is for a home range boiler, an automatic water heater or a commercial heavy pressure storage boiler, learn more about this remarkable improvement before you order.

Write for
descriptive catalog.

All types of Copper Boilers

DAHLQUIST MFG. COMPANY
70 WEST 3RD STREET SO. BOSTON, MASS.



CHASE ENTERS LIGHT FIXTURE FIELD

The Chase Brass & Copper Company is entering the electric lighting fixture field. In May, the company is opening its new exhibition floors in Chase Tower, 10 East 40th Street, simultaneously placing on display its coming line of lighting fixtures. The historical appropriateness of the occasion is seen in the fact that just fifty years ago, or five years after Edison discovered electric light, the company manufactured its first article for the lighting industry.

For the past three years, according to Mr. Rodney Chase, Assistant Secretary, this company has been studying into every phase of lighting fixture design, manufacture and distribution. During the past six months they have carried on an extensive personal survey of all important dealers in the industry in North Eastern United States. From these studies they have evolved definite policies regarding the line of fixtures, methods of distribution, and methods of meeting the public's desires. According to official statement the company "is convinced of the vital importance of authentic design at moderate prices." It is known that the coming Chase line is newly designed in every part and detail and contains no fixtures assembled from miscellany or other lines. In general charge of the manufacture and selling of the new lighting fixtures and lamps will be Earl F. Copp; directly in charge of sales, Clement E. Horton.

REVERE COPPER AND BRASS INCORPORATED

Arrangements have been completed whereby Revere Copper and Brass Incorporated will sell and distribute Streamline soldered fittings as manufactured by the Streamline Pipe and Fittings Company, Port Huron, Michigan, a division of the Mueller Brass Company. This will not in any way alter present selling plans of either company as regards other products but will mean that both will have these fittings available for sale.

Announcement also is made by C. D. Dallas, President of Revere Copper and Brass Incorporated, of the appointments of R. H. Binns, Jr. and S. H. Wilson, as Assistant General Sales Managers, with headquarters in the General Sales Department, New York Central Building, New York City.

CUTLER MAIL CHUTE COMPANY

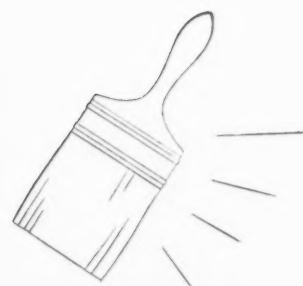
On April 16, 1934 the New York offices of the Cutler Mail Chute Company were removed to new quarters located at 1235 Architects Building, 101 Park Avenue.

NATIONAL RADIATOR CORPORATION

National Radiator Corporation, manufacturers of heating equipment, has appointed Fred R. Dannies manager of its New York office. Announcement also is made of the appointment of Paul J. Bracken as manager of the Boston sales office.

TRANSFORMED!

and the magic wand is a paint brush



Architect Francis Keally modernizes the Hotel Collingwood and gives his surfaces the charm that lasts

A GREAT WAVE of renovating sweeps the country. Architects knock down, tear out and reconstruct . . . give old exteriors new faces and shabby interiors a new deal.

Of the New York hotels that have recently changed face and form, one of the outstanding examples is the Collingwood on West 35th Street. The photographs above show how charmingly the main floor has been remodeled . . . transformed by Architect Francis Keally who planned and supervised the job.

The "before" and "after" pictures show that much of the charm comes from surfaces treated with paint.

"When the architect accepts a commission," says Mr. Keally, "he assumes a real responsibility in reference to the expenditures of the owner. He must, therefore, ever keep before him the importance of using products which possess three factors: utility, beauty, durability. This applies to paint as well as everything else in the building."

Dutch Boy provides paint for every surface . . . and every finish

Dutch Boy White-Lead makes paint for wood, plaster, wall board, metal, brick, stucco and other surfaces.

Moreover it makes paint for finishes of every kind. Mixed with lin-

seed oil it produces long-wearing gloss paints. Mixed with flattening oil it provides washable, tile-like flat and eggshell finishes . . . undercoatings for enamel . . . mottled, blended and textured effects. And by adding Dutch Boy Colors-in-Oil you can obtain any one of a thousand tints.

So plan your modernization with Dutch Boy in mind, whether it be for a hotel, a home or any other kind of a building. It offers not only utility, beauty and durability, but exceptional economy as well.



DUTCH BOY *All-Purpose Soft Paste* **WHITE-LEAD**

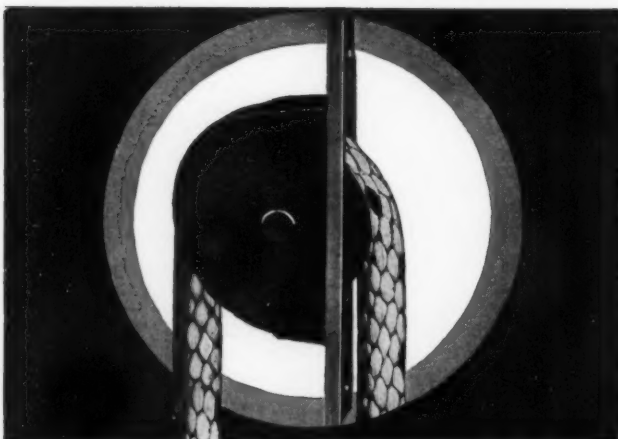
LINSEED OIL — FLATTING OIL — LIQUID DRIER — WALL PRIMER — COLORS-IN-OIL



NATIONAL LEAD COMPANY

111 Broadway, New York; 116 Oak Street, Buffalo; 900 W. 18th Street, Chicago; 659 Freeman Avenue, Cincinnati; 820 W. Superior Ave., Cleveland; 722 Chestnut Street, St. Louis; 2240 24th Street, San Francisco; National-Boston Lead Co., 800 Albany Street, Boston; National Lead & Oil Co. of Pa., 316 Fourth Avenue, Pittsburgh; John T. Lewis & Bros. Co., Widener Building Philadelphia.





**no REPLACEMENT
COSTS in thirty
years**

An average service of 30 years has been established by test for Samson Spot Cord. More than forty years of actual use substantiates these tests.

Samson Spot Cord is specified by architects because such specification is definite and positive—Spot Cord is made in one grade only and is identified by the trade mark, the colored spots. Substitution is easily detected and is unnecessary because Samson Spot Cord is available to contractors and builders through Hardware and Supply dealers in every section of the United States.

SAMSON CORDAGE WORKS
89 BROAD ST. BOSTON, MASS.

ONE GRADE
Positive identification

Made of extra quality fine three ply yarn, and guaranteed free from imperfections. Firmly braided, smoothly finished. Six standard sizes.

If you haven't a Spot Cord specification folder in your files write for copy. It gives complete data, comparative tests, etc.

RUBEROID DEFERRED PAYMENT PLAN

A finance plan has been inaugurated by the Ruberoid Co. of New York, manufacturers of roofing, siding and allied products. The new plan, designed to stimulate remodeling and alteration is extended to reputable dealers, applicators and contractors. Minimum amount of note purchased is \$50. There is no maximum. Contracts will be financed only when the value of the roofing material or allied products used is 25% or more of the total amount to be financed. The finance charge is 1% per month on the value of the contract minus the initial payment which must be at least 10%.

Many materials and products suited for use in remodeling and repair jobs are included in the Ruberoid line. Principal among these are asphalt shingles in many styles and colors, also textured asbestos-cement shingles and sidings for re-roofing and re-siding; Ruberoid Newmarble, an asbestos-cement panel reproducing natural marble, is widely used to modernize store fronts, theater lobbies, foyers, hallways, etc. Its companion product, Newtile, is suitable for remodeling bathrooms and kitchens or any other room where tiled walls are desired.

HOFFMAN SPECIALTY COMPANY, INC.

On and after April 1, 1934, the general sales department of The Hoffman Specialty Company, Inc., will be located at 500 Fifth Avenue, New York City.

REPUBLIC STEEL CORPORATION

Mr. Ralph G. Caulley has joined the Detroit District Sales Office of Republic Steel Corporation according to announcement made by Mr. N. J. Clarke, Vice President in charge of Sales. Mr. Caulley had been connected with Wheeling Steel Corporation for fourteen years, the last seven of which were spent in the Detroit district.

WHITTALL CHENILLE RUGS

W. & J. Sloane Selling Agents, Inc., are presenting a new group of Chenille Rugs in the modern trend, woven by M. J. Whittall Associates, Ltd. The group, known as Chalimar Chenille Rugs, consists of four patterns all of French derivation, and made in stock sizes. One of the patterns is called Leverneau, and is described as having all the warmth of a Matisse. Subtly blended colors in broad areas, mainly cedar tones and darker rusts, mark the individuality of the pattern. As a foil to these shades small ornamental groups in more colorful tones of sage, mahogany and wood shades are used. Bourdonnais is another design in the group, in which cedar, wood-tans and peach shades of pastel clearness predominate. Chantilly is a French Moderne pattern, carrying an extremely simple and non-ornamental design in light and delicate colors, with sage green predominating. Alencon is a subtle French pattern, unusual yet unobtrusive. Principal shades employed are beige, French gray and sand tones.